Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

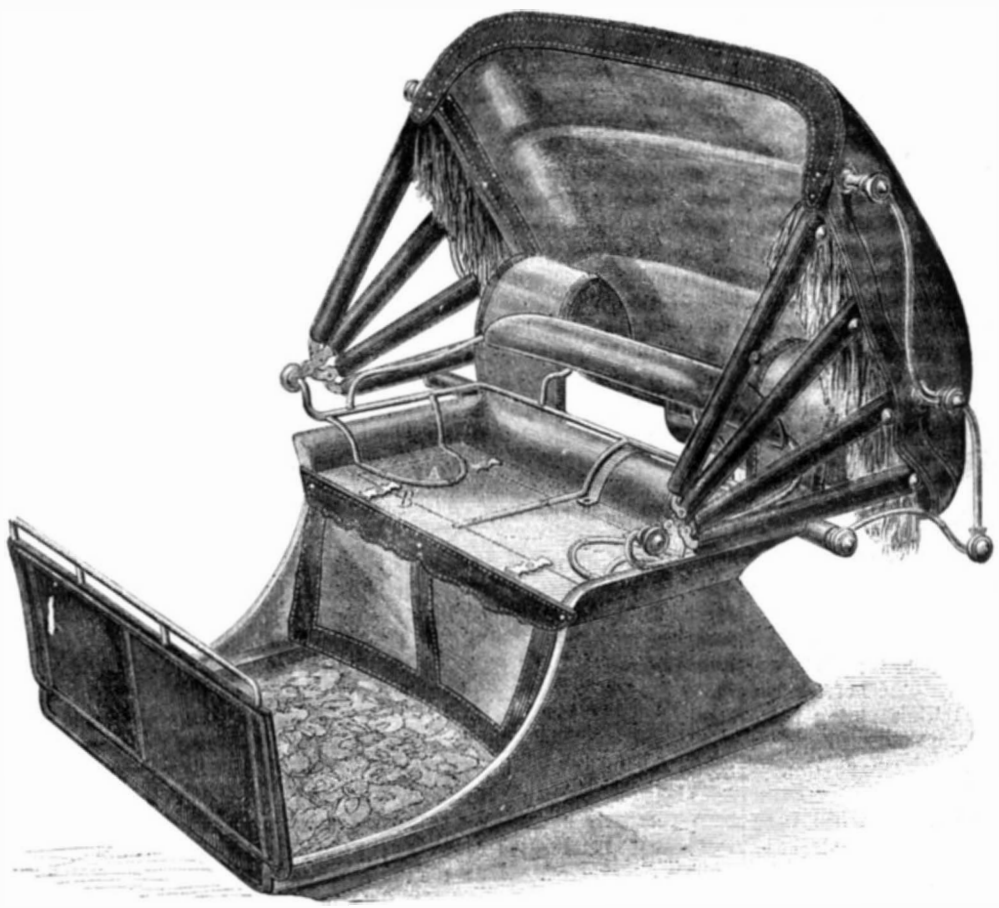
Vol. XIII---No. 15. (NEW SERIES.) NEW YORK, OCTOBER 7, 1865. $3 PER ANNUM IN ADVANCE.

Improved Carriage Top.

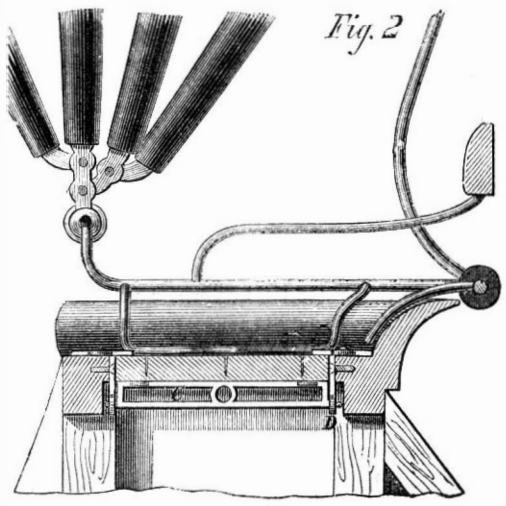
The seat of a buggy is usually made with a frame and a bottom fastened therein. In this improvement the frame is provided with two bottoms, but instead of being fastened permanently, fits loosely. The first or upper bottom is about an inch thick, and has the arms, which support the top, bolted or riveted to it; when the top is on the vehicle it is held in position by the buttons, B. The second or lower bottom, in Fig. 2, may be made of half-inch stuff, with pieces fastened across the under side to strengthen it. This bottom sinks below the level of the seat frame, the thickness of the first bottom, and has a piece of leather fastened upon it to form a handle by which to lift it out, which also forms a kind of spring for the first bottom to press upon and prevent rattling. This bottom rests on two metal bars, which are provided with journals or pivots, D, not in the center, but entirely on one side, and are suspended in hangers let in and screwed to the inside edge of the seat frame. The first or upper bottom, when on the vehicle, rests on the seat frame on the irons, which project over the ends and sides.

To remove the top, turn the buttons, lift it out of the frame and set it aside, then raise the lower bottom by means of the leather strap, turn up the bars, C C, which leaves a depth equal to the thickness of the bottom below the level of the seat frame; place the bottom on the bars—which are provided with flanges to prevent them from turning down—and turn the buttons. The seat is now level and ready to receive the cushion. The ordinary mode of attaching and detaching the top is by means of a number of nuts; these are liable to be lost or have the threads stripped, besides requiring some time and considerable patience to detach the top.

In this improvement the top can be taken off in a few minutes, and leaves no indication that there ever was one on the vehicle; besides, it is more substantial—taking all the weight and strain off the sides and back of the seat, which will, in the old plan, in a short time, break the joints in the corners.



KING & GARDNER'S CARRIAGE TOP.



These shifting tops can be made at the same cost as the old ones, except the expense of the two bars and their hangers, which are of malleable iron, and weigh about one pound and a half.

We regard this as a most convenient and durable arrangement. It was patented May 30, 1865. For further information or the purchase of rights, address the inventors, King & Gardner, Lexington, Ky.

Petroleum as Fuel.

A correspondent says:—At well No. 37 they were burning crude oil for fuel, and used two and one-half to three barrels per day. As oil is worth about $2 net, the cost is $5 to $6 per day Wood or coal would cost two or three times as much. A pan is placed on the ash-pit containing a layer of broken brick or other porous earthy matertal. A pipe with an elbow on the end, to turn the mouth up, leads from a reservoir and delivers the oil slowly over the middle of the pan, in suitable quantities, regulated by a cock.

THE Boston correspondent of the Springfield *Republican* reports that the Hoosac Tunnel workers have met with great obstacles at the west end, and that a hundred thousand dollars or more have been wasted there in attempts to excavate, which cannot succeed on account of soft rock and water.

Crayons.

Slender, soft, and somewhat friable cylinders, variously colored for delineating figures upon paper, usually called chalk drawings. Red, green, brown, and other colored crayons, are made with fine pipe or china clay paste, intimately mixed with earthy or metallic pigments, or in general with body or surface colors, then molded and dried. The brothers Joel, in Paris, employ as crayon cement the following composition: 6 parts of shellac, 4 parts of spirit of wine, 2 parts of turpentine, 12 parts of coloring powder, such as Prussian blue, orpiment, white lead, vermilion, etc., and 12 parts of blue clay. The clay, being elutriated passed through a hair sieve, and dried, is to be well incorporated by trituration with the solution of the shellac in the spirit of wine, the turpentine, and the pigment; and the doughy mass is to be pressed in proper molds, so as to acquire the desired shape. They are then dried by a stove heat.

In order to make cylindrical crayons, a copper cylinder about two inches in diameter, is employed, and 1½ inches long, open at one end and closed at the other with a perforated plate, containing holes corresponding to the sizes of the crayons. The paste is introduced into the open end, and forced through the holes of the bottom by a piston moved by a strong press. The vermicular pieces that pass through are cut to the proper lengths and dried. As the quality of the crayons depends entirely upon the fineness of the paste, mechanical means must be resorted to for effecting this object in the best manner.

General Lomet proposes the following composition for red crayons. He takes the softest hematite, grinds it upon a porphyry slab, and then carefully elutriates it. He makes it into a plastic paste with gum arabic and a little white soap, which he forms by molding, as above, through a syringe, and drying, into crayons. The proportions of the ingredients require to be carefully studied.

Various formulæ have been given for the formation of lithographic crayons. One of these prescribes, white wax, 4 parts; hard tallow soap, shellac, of each 2 parts; lamp black, 1 part. Another is, dried tallow soap and white wax, each 6 parts; lamp black, 1 part. This mixture being fused with a gentle heat, is to be cast into molds for forming crayons of a proper size. —*Dr. Ure.*

THE Polytechnic Association resumed its sessions on the 28th of September. The meetings are opened at 7½ P. M., every Thursday, and are free to all.

THE Fair of the American Institute closes on the 19th inst.

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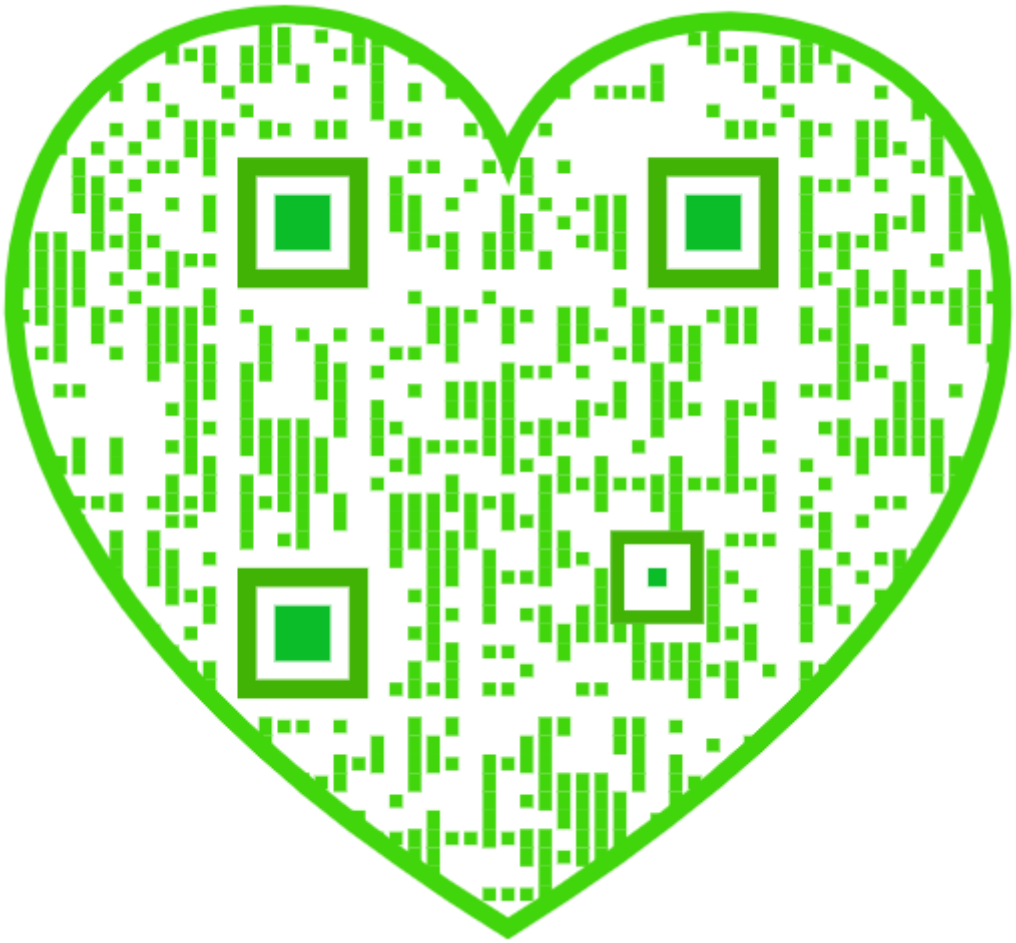

SAFETY LAMPS.

The safety lamp, as originally introduced by Sir H. Davy, in 1816, consists essentially of a common oil lamp, whose flame is isolated from the external atmosphere by a metallic envelope perforated with numerous small holes, a cylinder of wire gauze being generally employed. The holes are large enough to allow air to pass into the flame, and the products of combustion to flow freely; but owing to the cooling effect of the wire bars or walls of the apertures no gases in a state of ignition can pass through, the temperature being reduced by the metal below that necessary for the production of flame, so that in fiery mines, where carbureted hydrogen gas is present in the air in sufficient quantities to form an explosive mixture, only such portions as may be brought into direct contact with the flame of the lamp can be ignited, the explosion being confined within the wire cage, if the apertures be sufficiently small. The limit of safety for gauze of iron wire is placed at 28 parallel wires to an inch, or 784 apertures to the square inch, or about 1-5,000th of a square inch surface for each hole.

Various modifications of the above principles have been adopted from time to time, with the intent of obtaining more light or greater safety, several of which are represented in the 23 specimens in the collection at the Museum of Practical Geology at Jermyn street.

The Two First Safety Lamps ever used in a Coal Mine.—They were sent by Sir H. Davy, in 1816, to the Rev. John Hodgson, at the time vicar of Heworth, and presented by him to Miss Emma Trevelyan. They are of small size, having cylindrical copper oil vessels surmounted by chimneys of thin brass wire gauze, of a much finer mesh than has been employed subsequently. The gauze is protected by a cage of three vertical bars of stout iron wire fixed to a flat brass roof, into which the carrying ring is secured by a swivel joint. These are not to be confounded with Sir Humphry Davy's first experimental lamp, in the possession of the Royal Institution.

Common Davy Lamp.—This is one of the simplest forms of safety lamp. It has a cylinder of black iron wire gauze of 784 apertures to the inch, set in a brass ring, which screws on the top of the lamp. Three upright wires are fixed to the ring, and are drawn into a loop at the top, through which the carrying link is secured. The top portion of the gauze chimney is made of two overlapping cylinders; this is rendered necessary by the destructive effects of the hot gases on the iron wire, a single thickness being liable to be burnt into dangerously large holes at this point.

Davy Lamp, by H. Watson, Newcastle-on-Tyne.—This resembles the preceding one, with a few slight modifications. The carrying link is attached to an arched brass roof, which protects the miner's hand from being scorched by the escaping products of combustion. The common method of locking the Davy lamp is also shown. This consists of a simple screwed bolt pointed at the end, with a square head fitted with a key resembling a common watch key, which passes through a nut cut in a square boss attached to one side of the oil vessel, until the point is received in a hole drilled through the lower brass ring of the cage carrying the gauze. The bolt is of such a size, that when the lamp is locked the key end is sunk level with, or a little below the outer face of the boss, so that it cannot be unscrewed by the mere use of the fingers. In all cases a vertical wire hooked at one end is provided for trimming the wick; it slides through a tube passing through the body of the lamp.

Davy Lamp, for Burning Gas.—This is an extra large lamp, which was, for experimental purposes, for the use of the Royal Commission on Mines. It has no special peculiarities, beyond the substitution of a common single jet gas-burner, for the oil lamps of the preceding examples. The gauze case is doubled through a considerable portion of its length, only about one inch immediately above the flame being single.

Davy Lamp, with Condenser, by Newman.—The gauze of this lamp is doubled in a similar manner to that of the following. The single part is covered by a plano-convex or bull's-eye lens, set in a square brass frame, attached to two of the stay bars of the cage, for the purpose of concentrating the light,

Davy Lamp, from Hetton Colliery.—This is more slightly built than the preceding lamps, and is almost entirely made of brass. A curved horn shade is arranged so as to slide on two of the stay bars; it is added to protect the light from being directly acted on by currents either of air or gas. Many accidents have taken place with Davy lamps when exposed to sudden discharges of gas from coal; when the gauze becomes red-hot, and if the flame is blown to one side, the wire network is no longer capable of preventing the external atmosphere from taking fire, as the flame will, under these circumstances, pass through the holes.

Dr. Clanny's Safety Lamp.—This differs from the Davy lamp in having the lower portion of the gauze cylinder, the part immediately above the flame, replaced by a stout glass tube for the purpose of giving more light. The glass is of larger diameter than the gauze cylinder; it is mounted between two brass rings, connected together by six vertical stays, and is attached by one locking bolt to the lamp below, and by a second to the cage carrying the gauze above. The air for feeding the flame enters through the lower part of the gauze, and has to travel downward, but there is no special contrivance directing it, or for forcing the draught. The advantage of the glass in this lamp is more apparent than real, as on account of the great thickness of the glass envelop, a notable proportion of the light is absorbed, and the illuminating power is not much greater than that of a common Davy lamp.

Self-extinguishing Lamp, used at the Earl of Lonsdale's Collieries at Whitehaven.—This lamp is so contrived as to become extinguished by the act of opening, in order to prevent the miner from converting his lamp into a naked light, as is not unfrequently done with the common locked lamp by men who have obtained possession of private keys. Externally it resembles a common Davy lamp, but the lower ring or cap of the cage is unusually deep. On the inner side of the cap, above the thread of the screw by which it is attached to the lamp, is a thin shelf or plate of iron cut through in two places opposite to each other, leaving two notches about half an inch in width, which are filled by two wedge-shaped arms movable about fixed centers. The tube holding the wick is also cut through, having two narrow slits opposite each other, extending through its entire hight. To the top of the oil vessels are attached two unequal-armed levers, but in such a manner that the arms make an angle of about 100° with each other; the longer ones are tapered to a narrow chisel edge, somewhat less in breadth than the slits in the wick-holder, and are maintained by steel springs in a nearly vertical position when not in use, the shorter arms being at the same time horizontal. The latter have peculiarly shaped tails, forming transverse wedge-shaped blocks, the thickened ends having the corners rounded off. When the cap is screwed on the long tapered wedges attached to the cap pass over the upper surfaces of the wedge-ended arms of the angle levers without moving them, but on reversing the motion the points of the hinged wedges come in and pass underneath those on the shorter arms of the levers, so that the longer arms are depressed, and drive the wick downward in its tube. The action of the springs bring the longer arms back to the vertical position, as soon as the notched part of the plates arrive opposite to them, but they are immediately driven down again by the second hinged wedge, the result being an irregular jerking pressure on the wick, which extinguishes the flame before the cap and gauze cage are completely unscrewed from the lamp.

Self-extinguishing Lamps.—The lamps of M. Dubrulle, Lille, France, are similar in principle to that last described, but are differently constructed. The oil vessels are urn-shaped, and are made of zinc; one has three equi-distant studs projecting from its outer surface, which fit into three corresponding clutches in a covering plate forming the lower part of the cage. The locking bolt is a bent iron wire contained within the oil vessel, with a straight portion at the upper end, which passes through a hole in the top of the lamp, and is received into a hollow boss lined with brass in the covering plate. The bolt is maintained in position by a curved copper spring, also within the oil reservoir. The wick, formed of a single thickness of flat cotton plait, is held at the lower end by an iron clip with a short projecting arm, carrying a screwed nut, through which passes a vertical screw for raising or lowering it. The iron locking bolt is also provided with a projecting arm, with a round socket or eye, through which the vertical rod passes loosely, and it is only when the lower edge of the collar on the wick-holder is brought in contact with this arm that the bolt can be withdrawn; but this can only occur when the flame is extinguished by the withdrawal of the wick within its case. In putting the cage on, when the lamp is trimmed, the open parts of the clutches are brought over the studs, sufficient pressure being exerted to press back the locking bolt; the cage is then turned through a small angle to make the clutches take hold of the studs, and when the latter are in position the bolt springs up into its seat, and cannot be again withdrawn without screwing down the wick, as described.—*London Mining Journal.*

ON THE REVIVIFICATION OF ANIMAL CHARCOAL

BY HENRY MEDLOCK, PH. D., F. C. S., M. P. S.

The principal source of expense in a sugar refinery is that of animal charcoal, and it is a great desideratum to the refiner, commencing with the use of new animal black, to adopt a means of keeping his coal in good condition, and retaining unimpaired its decolorizing powers after each successive use. I will treat the subject very briefly under the following heads:—

1st. The composition of bone and animal charcoal.

2d. Its decolorizing property, and the causes of its becoming inactive.

3d. The means of restoring its primitive powers of absorption and decolorization.

I. *The Composition of Bone and Animal Charcoal.*—Bone, as is well known to anatomists, is a solid structure, composed principally of phosphate of lime and osseine, a modified form of gelatin. The phosphate of lime, or solid portion of the bone, is composed of an infinite number of minute, almost microscopic cells, which are filled up by osseine, and bound thereby, as with a cement, into a solid mass.

The composition of bone, after the removal of adhering fat by boiling, is as follows:—

	Per Cent.
Phosphate of lime	63·1
Carbonate of lime	1·4
Phosphate of magnesia	2·1
Other salts	2·4
Osseine	31·0
Total	100·0

When submitted to heat in a closed vessel, to which air cannot gain access, the osseine is decomposed, evolving oily and ammoniacal products, which are, by suitable arrangements, collected and applied to many useful and economical purposes. In the retort remains the cellular structure of the bone in a most porous condition, each cell and pore being coated with a thin film of finely divided carbon, resulting from the decomposition of the organic osseine.

The purely chemical reasons why the porous animal charcoal should possess such extraordinary decolorizing and general absorptive properties, is a question I need not enter into, but I shall do so fully in a forthcoming pamphlet.

II. *The Decolorizing Properties of Animal Charcoal, and the Causes of its becoming Inactive.*—It is well known to the refiner that his charcoal too soon loses the power of decolorizing his sirups, and the question arises, what is this owing to? It is, *à priori*, assumed that it is owing to the grains of coal becoming coated on the surface with the slimy aluminous and mucilaginous matters contained in the raw sugar, which destroy to a great extent its porosity. This is, doubtlessly, one cause; but the principal, and by far the most serious, cause is the presence of lime in the raw sugar, and which in a short time effectually chokes up the pores, and in the process of reburning cannot be removed, although the mucilaginous materials are destroyed.

III. *The Means of Restoring its Primary Powers of Absorption and Decolorization.*—When the charcoal ceases to decolorize, it is usually washed with hot water to remove the sirup remaining therein, and then reburned in closed furnaces of various construction, the object of reburning being to carbonize the coloring matters extracted from the sirups. This restores to some extent the decolorizing powers of the charcoal; but at each successive reburning

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the coal continues to lose its properties, and at last ceases altogether to act as a decolorizer, unless it is mixed, after each reburning, with a certain portion of new charcoal.

Another process, and one frequently adopted, is to destroy the organic matters by keeping the charcoal in water and allowing it to ferment for several days, adding fresh water containing about ¼ to ½ per cent of hydrochloric acid. The little acetic acid formed, and the hydrochloric acid added, dissolve a small quantity of lime, and so far act beneficially. But the good effect is more than neutralized by the fact of the acids attacking the structure of the bone itself, namely, the phosphate of lime, thus rendering the coal friable, and consequently making much dust and waste.

Having referred to the two methods in common use of revivifying the decolorizing powers of charcoal, and alluded to their inutility and defects, I will describe a new method, as simple as it is ingenious, of rendering old and comparatively useless charcoal as good, and, indeed, better than new. Corenwinder, an eminent German chemist, has, by numerous experiments, established the following axiom, namely:—

"That the decolorizing power of charcoal used in sugar refining is correlative to its power of absorbing lime."

In other words, the more the pores of the coal become choked up with lime the less is its power of decolorizing. Now, to remove the obnoxious lime without attacking the structure of the bone itself, is a question which has occupied for many years the ingenious mind of my friend, Edward Beanes, C. E., F. C. S.

Mr. Beanes, who, by his chemical researches on the sugar plantations of Cuba, has enabled the planters not only to produce much finer qualities of sugar, but considerably to augment their produce, has recently patented a process of restoring to charcoal its primitive properties of decolorizing sirups. Mr. Beanes found that charcoal, perfectly dry and hot, absorbs dry hydrochloric gas with the greatest avidity and in enormous quantity. The gas combines with the lime and converts it into soluble chloride of calcium. After the charcoal has been treated with gas, a portion of untreated charcoal is mixed up with it; the combined gas remaining in the pores of the former is taken up by the latter, and the whole becomes neutral; the chloride of calcium is then washed out—requiring only a few hours—and the charcoal is afterward burned in the usual way. It is then found that the decolorizing power of the charcoal is augmented at least 100 per cent.

The advantages of Mr. Beanes's process are as follows:—

1st. It removes the whole of the lime and carbonate of lime from the pores without attacking the phosphate.

2d. It augments the decolorizing powers of the coal upward of 100 per cent.

3d. It requires no expensive apparatus, and the process is almost costless, two saleable products being obtained nearly equal in value to the materials employed.

I have thus ventured to introduce Mr. Beanes's process to the notice of English refiners, not simply from feelings of personal friendship, but from the firm conviction that by its general adoption he will confer as great a benefit on his own countrymen as he has already conferred upon the sugar manufacturers of Cuba.—*London Chemical News.*

THE FAIR OF THE AMERICAN INSTITUTE.

The room is now filled with articles on exhibition, and the large attendance promises to make the fair a pecuniary success—a more favorable result than has been realized in many years. We continue our notice of objects of interest.

FRENCH SELF-FASTENING BUTTONS.

This invention is interesting principally on account of the high price for which the patent was sold—$125,000 in money. The shank is made separate from the button; it consists of a small plate, which comes against the back side of the cloth, and a central stud or hook. The hook is caught into the eye of a stout needle, which is passed through the cloth, dragging the hook after it; an india-rubber washer is then slipped over the hook, and the button is pressed upon it and given a quarter turn, which fastens it securely. A button is thus put on in an instant without any sewing. The agent of the company is W. B. Watkins, No. 80 Reade street, New York.

COLLECTION OF MINERALS.

Mr. C. Chipman exhibits an interesting collection of minerals, among them two masses of copper ore, weighing, one 300 pounds, and the other 240 pounds. They are mixtures of red oxide and native copper, containing 90 per cent of metal. They are from Del Norte County, California. The vein is from six to eight feet in width, five miles in length, and of unknown depth—one of the most valuable mines in the world. In the collection are the following minerals, all picked up by Mr. Chipman on this island:—

Serpentine, pyroxene, staurotite, graphite, tourmaline, mica, talc, molybdite, apatite, amianthus, garnet, actinolite, vivianite, lameller feldspar, apophyllite, rutile, epidote, pyrites, stilbite, quartz, magnetic iron.

TRAVELING INSTRUMENT.

Messrs. Schon & Hull, of Lafayette Ind., exhibit a very novel and ingenious machine for running lines of levels in surveying and making profiles of the ground. Two brass wheels, about 2½ feet in diameter, and following one after the other, support a light carriage which bears a heavy pendulum connected with clock-work. The pendulum maintains its vertical position, and the inclination of the carriage varies the position of a pencil pressing against a slowly revolving cylinder, so as to draw a line corresponding with the profile of the ground passed over; at the same time index hands are turned to give the altitude in feet and fractions. In ascending, the pencil must be carried outward along the cylinder with a rapidity proportioned to the rapidity of the ascent; in descending, it must be drawn in the opposite direction with the same relative motion; while on level ground, it must be held in a constant position. These motions are effected by a very simple device. A horizontal wheel has a vertical wheel pressing upon it and driving it by friction—the position of the vertical wheel depending upon the inclination of the carriage. When the vertical wheel presses upon the center of the horizontal wheel, the latter is not turned in either direction; when the vertical wheel is on one side of the centre of the horizontal wheel, the latter is turned in the direction to carry the pencil outward along the cylinder; and when upon the opposite side it is turned in the direction to carry the pencil inward.

This instrument would enable one man to run five to ten miles of levels in a day, instead of the three men usually employed to run from one to three miles, and it is probable that the levels would be sufficiently accurate for preliminary surveys. Of course, no engineer would trust to such a machine in the final location of a line, or in laying rails, though it might answer for taking cross sections and setting slope stakes.

BRICK-MAKING MACHINE.

Messrs. Chambers, Brother & Co., of Philadelphia, exhibit a working model of their novel brick-making machine. It consists of a conoidal iron vessel, with a rotating shaft in its axis, the shaft being furnished with spiral blades, which cut and temper the clay, at the same time forcing it along toward the smaller end of the vessel, where it is finally pressed out through a rectangular opening, in a continuous bar, of the proper size for a brick. This bar is borne along on an endless belt to a revolving wheel, carrying a knife, which cuts the bar into pieces of suitable length for brick.

THE PEOPLE'S CLOTHES WRINGER.

This machine has its rolls constructed from cork; in other respects it is like those usually sold. It is said to be very efficient and durable, being particularly adapted to wringing clothes hot. No. 494 Broadway, New York.

FLASS'S NIGHT-LAMP ATTACHMENT.

This invention consists of a novel appliance for closing the wick of a kerosene lamp so as to diminish the flame. It is stated to be free from the disagreeable odor attending the common method of lowering the flame. No. 110 East 29th street, near Third avenue, New York.

THE "KAPUO KATHAIRIC."

This somewhat ponderous title is affixed to several highly-finished wooden pipes of peculiar shape. It is defined by the inventor as "smoke purifying," and is intended to deliver smokers from the bad effects of the nicotine in the weed. It is constructed with a cavity at the bottom for the oil and another near the top of the bowl on one side, and still another cavity at the bottom; these are connected by passages which look like the letter N, the cavities being at the angles of the top and bottom. A piece of sponge is placed in the top, and the smoke is purified in passing through it.

LEAD BURNING.

A curious specimen of workmanship is shown by Paul Marcellin of No. 13 High street, Brooklyn; it consists in a peculiar process whereby sheets of lead are joined homogeneously by being burnt to each other—the point of junction being invisible and the surface almost as smooth as the sheet itself. It is very strong, and is much used by chemists and manufacturers.

BOILER-TUBE BRUSHER.

Brushes of wire arranged spirally have been used for some time in cleaning tubes which have become incrusted with soot and ashes. The New England Tube Brush Company exhibit some of these brushes made of flat wire, not round. They are made of spring-tempered steel wire, and act as cutters by reason of the square ends.

TOSHACH'S WINDOW CATCH.

This article is a very efficient one for the purpose. Car windows, as generally furnished with these things, are continually out of order, and can be set at certain points only. This catch allows the window to be set anywhere, and is easy to manufacture. Wm. Toshach, No. 54 William street, New York.

OSCILLATING ENGINES.

Wm. D. Andrews & Bro. make a large display of their peculiar oscillating engines. The cylinders of these engines take steam by vibrating past ports in a fixed chest at the bottom, and they work with great rapidity and ease. They are shown in connection with Andrew's centrifugal pumps, No. 414 Water street, New York.

CANNED FRUIT.

C. C. Williams, of No. 9 Barclay street, exhibits some beautiful specimens of canned fruit in self-sealing jars. Nothing can exceed the clearness of the sirups or the perfection of the colors in the several varieties.

A POCKET LANTERN.

This is a neat little affair, intended to shed light in dark places, and to be always found when wanted; in a word, to be carried in the pocket. It is made of tin, neatly lacquered; it folds up about the size of a small testament, and is a very useful thing to travelers and others. New York Lamp Company, No. 259 Pearl street.

A. & F. BROWN'S ENGINES.

This firm exhibit one of their oscillating engines and steam pumps; the engine is exceedingly neat in design, strong and well proportioned, and receives steam through an ordinary slide valve worked beneath the cylinder. Such an oscillating engine can be easily repaired, if necessary, by any mechanic, and is quite economical of fuel. Any length of stroke can be had, which is not the case with some other kinds. The exhibitors of these engines append a card to them stating thas they will be shown in motion when steam is up. From this we infer that steam is not generally "up," and we have been waiting some time to learn why. The pump shown by Messrs. Brown is highly approved of.

NO STEAM.

We have been waiting some time to see the steam pumps in operation, but have not been gratified. For some reason or other no steam is furnished to one half the machines, and those who go in the morning, as we do, are apt to be disappointed.

This is the second week of the Fair, but yet the concern is not complete or perfect, and engines are being erected and other operations carried on which ought to have been finished before the Fair opened. If the machinery is to be shown in motion, why not put it in motion, and not disappoint hundreds of people who come from a distance?

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Improved Grain Separator and Cleaner.

This machine is intended to clean and separate grain at thrashing—by one and the same operation—from smut, chess, cockle, bad grain, seeds, and all other impure stuff, as dust, chaff, sticks, and all kinds of rubbish which destroy its appearance and market value. It delivers the grain direct from the machine to the sack, ready for shipment. The inventor says that this machine is the most effective known; there is no shaking motion about it to impair its durability, but it runs regular and steady.

This machine is also economical for thrashing and cleaning barley; it delivers it separated and clean of beards in the sack ready for market; most other machines deliver barley so bearded that it must be tramped with horses or otherwise, and cleaned over with a winnowing mill before it can be sold. It is small, light and requires but little power; it can be built at a comparatively low price; it is not in the way around the thrashing machine, and is easy on the operatives; it sets on the top of the thrasher, out of the way, and is run by a single belt.

The machine has six different outlets—the first for sand and small seeds of all kinds; the second for wheat, grain heads or unthrashed grain and coarser stuff; the third for the clean wheat or grain; the fourth for a second quality of grain, if it should be needed, for seed; the fifth for chess, defective grain, cockle, and other seeds valuable for stock feed; and the sixth for dust, smut, chaff and other light stuff of no value, which is all blown back in the straw. Sprouted grain is taken out separately. The apparatus can be built larger or smaller to suit the thrasher for horse or steam power. It is here represented on a large steam thrasher, the photograph from which this was made being taken in the field where it operated.

This separator is shut up all round; none of the machinery or grain can be seen from the outside. It is thus well protected, and nothing can fall in accidentally to stop or break any part, and the operatives cannot be caught in it; the running parts can be oiled outside while the machine is at work, and any detail can be reached by opening the several doors and hand holes provided—items of great consideration in running machinery.

The arrangement of this separator is as follows:—the thrashing cylinder shaft has two pulleys, A and C, the smaller one driving the beater shaft, and a small pulley on the beater shaft driving the elevator, B, and pulley. The larger pulley on the cylinder shaft drives the fanning-mill pulley, at a high velocity. The fanning-mill shaft has a left-hand screw on it inside the frame, which turns a spur wheel above; the spur-wheel shaft has a bevel wheel at the other end, which drives the revolving screen, D, slowly round. There is also a screw conveyer running at a moderate speed. On the other end of the revolving screen shaft is a pulley which drives a small elevator, to convey all wheat heads dropping out of the revolving screen at the end to the thrashing cylinder; this conveyer is not seen or represented.

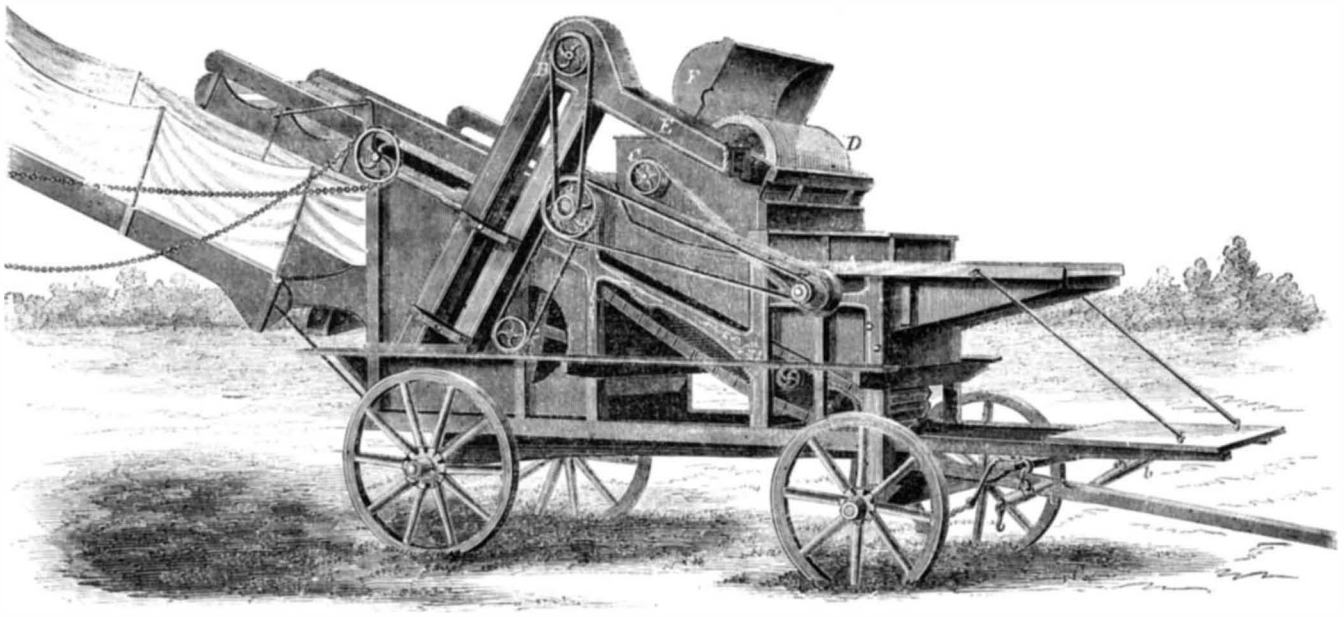
After the grain is thrashed and deprived of its straw and chaff, it runs from the coarse riddle with all the heads, sand, seeds and stuff mixed with the grain, to the elevator at the bottom of the thrasher. The elevator carries it up and empties it in the spout, E; this leads it to the revolving screen, which has two different sizes of mesh—the first one fine, which sifts all the fine particles out through a chute, from which it emerges, finally, into any receptacle. The heavier and coarser particles run further, to the coarser mesh, from whence the good grain subsequently drops into the screw conveyer; still coarser stuff—such as wheat heads, stones, sticks of wood and weeds, drop out at the end of the screen into another chute. A small conveyer, not shown, driven by the pulley on the screen shaft, carries these things back to the thrashing cylinder.

The grain which drops into the screw conveyer is carried along in a chute, from whence it falls into a suction blast tube, and finally out of the machine into a hopper; from thence into a sack, ready for market. All particles lighter are lifted up by the power of the suction blast; or, if of such a weight as to be useful, they drop on a sliding board, which is hinged at the upper end, and opened and closed as desired by an iron rod and ring; such grain drops in a middle apartment on the flap which opens after a certain weight is on it and lets the grain run out, or it can be kept separate if desired. Still lighter grain is lifted up and round in the tube and dropped out after a certain weight presses the flap open. This can be kept for stock feed if wanted. Smut, chaff, light stuff and dust are sucked in through a square and serrated opening to the suction mill and blown out over the straw.

The lifting power of the suction blast can be regulated to any degree desired by suitable mechanism. A large door can be seen at F, which opens to the revolving screen, so that it can be taken out to change the wire cloth on it with a finer or coarser mesh in a moment if wanted. There are other hand holes which are opened to do anything inside.

This separator and cleaner can be built on any thrasher now in use, old or new, without adding pulleys and belts, with a small addition of weight and but little more power; for several parts of the thrasher are removed as useless, which this separator takes the place of, so that the additional cost will be small in new machines. It has been used for two seasons with the greatest success, and on thrashers of different patents; it stood the hardest trials in all kinds of grain.

It was patented July 5, 1864, through the Scientific American Patent Agency, by J. N. Clees, of Darbyville, Pickaway County, Ohio. All manufacturers of thrashing machines interested should address the patentee at that place for State rights or other information.



CLEES'S GRAIN SEPARATOR AND CLEANER.

One hundred and eighty houses in Paris are engaged in the manufacturing of piano-fortes. They employ over 2,300 workmen.

FARMERS' CLUB.

After its summer recess, the Club, on the 26th of September, resumed its weekly sessions, which are held Tuesday afternoons, at Room 24, Cooper Institute—the meetings opening at half-past one o'clock, P. M., and being free to all who choose to attend. As usual, the faithful President, N. C. Ely, Esq., was in the chair. The Scientific American not being an agricultural paper, it is our practice to select for publication only such portion of the proceedings of the Club as we suppose will be of general interest to our readers.

PLANT LICE.

Dr. Trimble, in reply to a correspondent, stated that each species of plant lice has its peculiar plant on which to live. The species are positively distinguished from each other by the number of lenses in their eyes, which may be counted by the aid of a microscope. Man has no power over these pests, but nature has provided three enemies by which they are held in check; the larvæ of certain flies, the warbling birds, which, in their annual migration northward, stop during the prevalence of the aphids, and still more efficient, the lady bugs, which devour the lice in innumerable multitudes. These enemies generally obtain mastery of the aphids in the course of two or three years. At one time our hop growers were nearly discouraged by the destruction of their vines by plant lice, but the pests have now disappeared. The opinion prevails somewhat extensively that the eating of the hop vines by aphids was prevented by sowing buckwheat, but this is a mistake—the result of a mere coincidence; the aphids which live upon buckwheat are a different species from those that devour the hop plant, as the speaker had ascertained by counting the lenses of their eyes.

SIXTEEN HUNDRED DOLLARS AN ACRE FOR CULTIVATED CRANBERRIES.

Dr. Trimble invited the members of the Club present to visit Ocean county, in New Jersey, and see the fields of cultivated cranberries growing there; stating that $1,600 had been offered this year for the product of a single acre.

THE WAY TO KEEP CIDER.

Solon Robinson, in reply to the question of a correspondent, said that the way to keep cider good, is to get it clean by repeated racking, and fining with isinglass, and then put it up in new, clean. and tight barrels. He had drunk cider put up in this way which was 17 years old, and it was equal to wine; it was the finest cider that he ever saw.

Arsenic.—Of all metalloids arsenic is most easily isolated by electricity, for it is almost as good a conductor as a metal. By means of an apparatus (known as simple in electro-chemistry), all the metalloid they contain may be very rapidly extracted from arseniferous substances. Place a solution of arsenical matter in a platinum vessel, plunge a zinc wire into the liquid, and the arsenic will appear on the platinum; by prolonging the action the whole of the arsenic is ex-

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tracted from its compound. This method may be varied in different ways, and renders valuable service in medico-legal researches; it is much superior in sensibility to the process actually in use.

FISSURES IN SAND ROCK THE RESERVOIRS OF PETROLEUM.

BY R. P. STEVENS.

[For the Scientific American.]

The paleozoic, or sedementary strata, west of the Alleghany Mountains, have three important systems of fissures or shrinkage cracks. One generally running with the magnetic lines, or north and south; another at right angles, and the third perpendicular to the above. Besides these there are subordinate ones, crossing the others at various angles, from only a few degrees to forty-five. It is by means of these fissures that the limestones and slates of the West are so easily removed from their beds in the quarries. The longitudinal fissures will extend to great distances. In the lead-bearing limestones of the Black River country I measured one in a due east and west course, across the entire plateau, for three-fourths of a mile. On the Alleghany River, I have traced them across the valley to quite the same distance, and, in Virginia, one has been traced for many miles.

The perpendicular fissures will often reach through the whole thickness of a particular series of rocks, forming chasms many hundred feet deep.

In the great bed of coarse, pebbly, and fine-grained sandstone forming the base of the coal rocks of Pennsylvania, these latter fissures divide the rocks into immense square blocks, with spaces 10, 15, and even 40 feet between.

These fissures in ancient times were often water channels, and have since become filled with the result of such drainage, viz., cemented sands, pure silex, clays and ores. In this way we account for the iron ores of the trap rocks of Nova Scotia, the veins of jasper, spar and other minerals in the same rocks; the veins of lead in the Shawangunk Mountains, as the Erie and Ellenville lodes, and probably also the gold and silver mines of our Western States and territories. When the veins become filled with material, the course of water drainage is changed, and the waters seek some new channel. Lately we have seen in Nova Scotia the central fissure of the vein filled with mud. This is almost always seen in the lead and hematite caves of Missouri and the Galena region. One of these fissures, east and west, in the Alleghany Mountains is thus spoken of by J. P. Lesley, Esq., of Philadelphia:—"There stands this vertical, east and west running vein of solid petroleum, an evidence both of the abundance and of the antiquity of the Devonian petroleum."

A peculiar feature attending these perpendicular fissures may here be noticed. In their downward extent they will most usually be cut off by the intervention of a stratum of dissimilar nature, or composed of different material. Thus, fissures of limestone will be interrupted by a very thin layer of sandstone or sandy shale. Thus, in the great lead region of the upper Mississippi, sand rocks always cut off the veins of lead.

Another important feature of veins in mountain systems we will also notice.

It has long been well established by M. E. Beaumont, of France, and Prof. J. Dana, of our country, that mountain ranges are upheaved along great fissures in the rock strata of the earth, pursuing definite directions, according to the age of the upheaval, as, for instance, the Alleghanies have a general north-east and south-west direction. In these mountains all the main fissures will have the same direction, and the veins of iron ore, copper or graphite will obey the same law, while the subordinate fissures will be at right angles, or north-west and south-east.

In the Shawangunk Mountains the course of the mountains is north 20° east; the longitudinal fissures have the same course, while the cross fissures run south 60° east, and north 60° west. The Galena veins of these mountains are in the latter system.

Besides the fissures already mentioned there are innumerable other ones, running horizontally with the strata, and minor cross cracks, due in part to shrinkage, and in part to repeated upheavals and down throws. These, when viewed separately, seem of minor importance, but, when viewed in the aggregate, become very important in the amount of any fluid they may hold, whether of gas, oil or water.

When we stand by the side of any of the great spouting oil wells of Oil Creek, as, for example, the Empire, in its flowing stage, and see it flowing at the rate of 1,000 barrels of oil per day for many months in succession, we naturally look for the original reservoir hidden in the rocks below, which is capable of holding such an immense quantity of fluid.

To the fissures of the third sand rock must we look for this reservoir. Unfortunately, this rock is hidden 500 feet beneath the surface, at the point of penetration by the bore of the Empire well. It is, therefore, impossible to descend into it; we must reason by analogy, or search for subterranean tanks where this rock comes to the surface. Fortunately, owing to the dip of this, and all contiguous rock to the south, at the rate of about eleven feet to the mile, by traveling northward and ascending the dip we are enabled to find this sandstone coming to the surface. Accordingly, on French Creek we can see it, cut up by its numerable fissures—so much that it is quite difficult to find any very large-sized mass. In similar sand rocks I have measured fissures 10, 12 and 15 inches wide running many rods in linear extent.

The whole of the Devonian series of rocks, wherever seen in chasms, ravines and river bluffs, is always cut up by the system of fissures already described. Now, these Devonian rocks are our great receptacles of oil, whether in Canada or the United States. Alluding to the quautity of fluid these cavities can contain, the writer already quoted has so ably stated the subject, we shall continue to quote from him.

"Some of the main fissures are known to be four inches wide. Suppose them of all sizes, from four inches to a quarter of an inch in width, and at various distances, as under from 5 to 50 feet, and to be limited to the sand rock itself, say 30 feet in hight; suppose we take the contents of the fissures to be equal to $\frac{1}{500}$th of the mass of the rock. Now, supposing the oil to occupy but $\frac{1}{10}$th of the space in each fissure, the rest being occupied by gas and water, we have a yield of oil from each square mile of sand rock, amounting to nearly 50,000 barrels of oil."

Another source of oil has been demonstrated by excavations in the oil-bearing sand rocks of Ohio, and this is, the pores of the sand rock itself. The rock is saturated with oil to that degree that from open cuts it oozes out in sufficient amount to become an economical investment to cut into this rock by deep and lateral excavations.

P. Sterry Hunt, of Montreal, has made some experiments testing the capacity of sand rocks to hold water or other fluids. The mean of his results will give seven gallons per minute for thirteen years from one mile square and one hundred feet thick. From a rock as porous as the oil-bearing rocks of Venango County, this quantity should be increased five-fold.

The able author from whom we have already so largely quoted, has also made some calculations upon this point of our subject. He thus says:—"Every foot of gravel-rock may be considered to consist of three-fourths quartz, etc., and one-fourth cavity, occupied by water and oil. If we suppose only the uppermost four inches of the whole formation charged with pure oil, that would give an absolute layer of oil one inch thick, underspreading the whole country as far as the sand rock extends, or about 4,000 millions of square inches under every square mile; or, in other words, 17$\frac{1}{3}$ millions of gallons, equaling 551,706 barrels."

When we consider that there are many sand rocks thus charged—not less than fourteen, and possibly as many more—extending over many hundred square miles of territory, much of which has yet been unexplored, we may rest in the fullest confidence that petroleum, in its regular supply and permanent quantity, will not fail of becoming one of the most important mining enterprizes of our country, as well as one of the most remunerative, to capital judiciously invested and economically expended.

Lightning Arresters.

Lightning arresters have attracted considerable attention of telegraphers from time to time, and many have been introduced, used for a while and then thrown aside. None have been invented that have answered fully the purposes for which they are intended, and when we take a philosophical view of the subject, it seems quite difficult, if not impossible, to accomplish it perfectly. The desideratum to be arrived at is an arrester which will, at all times, carry off the great bulk of the atmospheric electricity, thereby preventing its passage into the helix or cable, and retain its arresting power unimpared, and also leave the conductor uninjured. In other words, to separate the atmospheric from the battery electricity, convey the former to the ground, and secure the passage of the latter over the conductor, to the terminus of the line for which it was intended.

The one mostly in use at the present time is that of two plates of brass, separated by thin strips of glass, isinglass, hard rubber, or gutta-percha tissue, the upper plate forming a portion of the conductor, and the lower one being attached to the ground for the purpose of providing a medium for the atmospheric electricity to pass off, which it will do, provided the conductor does not present a better medium for its transit than the space between the plates. The plates being larger than the conducting wire, the question arises, does not this plate become, so to speak, a reservoir for the electricity, and must it not become surcharged before it will leave the one plate and pass through the space, which is non-conducting, to the other? If so, it is plain that the principle of plates is erroneous. These plates, to be effective, must be placed as closely together as possible, and not touch, so that if the electricity does pass off in this way, it is almost sure to fuse the two plates, thus giving a ground circuit to the line.

If this theory is correct, there seems to be a field for the inventive genius of our telegraphic friends, and our telegraph companies should look carefully after any improvements that will supply the deficiency which now seems to exist.—*The Telegrapher.*

SUBSTITUTES FOR ALCOHOL AND METHYLENE AS SOLVENTS FOR ANILINE DYES.

BY M. GAULTIER DE CLAUBRY.

With the exception of fuchsine and the violet of Perkin, the tinctorial substances coming from aniline and in its congeners, naphthalin, petroleum, the phenic compounds, etc., are insoluble in water, and can be employed in dyeing only in solution in alcohol. Many fruitless attempts have been made to replace this vehicle by substances of a less elevated price. It is the solution of the following problem which occupies us, and the results obtained are to-day sanctioned by experience:—To find substances which will render these colors soluble in water, without modifying their characters, permitting the dyeing and printing of tissues in the conditions habitual in the manufactories, furnishing colors well united and of all tints, of an easy employment, exercising no action injurious to the health of the workmen, and reducing in a large proportion, the price of the manufactured products.

The violets, taken as an example, are composed of red and blue elements—the first more soluble in divers vehicles, the second very difficult sometimes to dissolve.

The alcoholic solution, mingled in suitable proportion with water, furnishes a bath which, abandoned to repose, allows spontaneously to precipitate a very large part of the color, and retains only the red; the light ebullition to which it must be raised for dyeing, disengages easily this alcohol, augments the precipitation, and determines the production of an unequal deposit of the color on the threads and tissues, which explains at the same time the difficulty of obtaining tints perfectly united, and the liability of this class of colors to be rubbed from off the tissues on which they are deposited, (*le caractere que present plus ou moins les objets teints avec ce genre de produits de tacher le linge par le frottement*). The colors obtained by aid of the solutions which are the subject of this memoir, are, on the contrary, easily obtained, they are of a uniform tint, and the coloring liquid which impregnates them is expelled by washing and wringing on coming out from the bath.

A great number of substances give to water the property of dissolving colors, which, heretofore, have been dissolved only by alcohol; we shall signal among them gums and mucilages, soap, and, in particular, that of almonds, glucose, dextrin, jellies of starch,

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lichens and fucus, and, in particular, of *fucus crispus*, glycerin, gelatin and animal jellies; but those which offer the results the most advantageous and the most practical are decoctions of the bark known in commerce under the name of *panama* (*Quillaïa saponaria*) and the root of saponaire of Egypt (*Gypsophila strutiium*). *Saponaria officinalis* may also be employed, but it acts less energetically. All these substances have the common character of thickening the water and making it froth. The solution of the coloring products is easily effected by pouring on their powder the boiling solutions, agitating, decanting, and, if a portion remains undissolved, recommencing the operation. These liquors may be evaporated to extracts; but a long ebullition—above all, if the water contains sulphate or carbonate of lime—may modify the colors. But it is preferable to use extract of saponaire of Egypt, for example, with which the color in fine powder is triturated; the water added afterward successively dissolves, with suitable care, the whole of the product; but in this case, as in the preceding, the first liquors remove the more soluble reds, while the blues are dissolved with more difficulty, so that it is necessary to thoroughly mingle all the liquors.

The same modes of operating and the same precautions are necessary, when the operation is on blue colors formed also of divers products unequally soluble. No particular precaution is required in using these solutions, and tints perfectly united are obtained with the greatest facility. If it is desired to continue the use of alcohol, a much smaller quantity will be necessary; the coloring product may be first infused in a small quantity of alcohol, finishing the solution with the saponaire extract; or the extract may be first employed, and the solution completed with a little alcohol."

[We find this article in *L'Invention*, credited to *Comptes rendus de l'Academie des Sciences*, and we make our translation as literal as possible.—Eds. Sci. Am.

How to Cast Sugar Candies.

We extract the following from a very interesting article on the subject, in a recent number of *Once a Week:*—

"What an atmosphere of dust meets us as we enter the manufactory! The shop we are in is powdered from rafter to floor with a fine impalpable powder, that reminds us of the interior of a flour mill, and the workmen are moving ghosts, even the fringes of their eyelashes are whitened to their tips, just as the hoar frort whitens every tiny filament it can lay hold of. The dust is that of fine starch, the substance used as a matrix for a certain class of cast sugar goods. We are in that part of the factory now where those 'sweets' are made which are demi-opaque—like snow water frozen. The sugar is not boiled to a great heat, but is allowed gently to simmer on the fire, while the molds in which it is to be cast are being prepared. This is done by spreading the fine starch over boards, quite evenly, and then inverting another board over it, studded with the forms it is intended to cast. The man we are looking at is about making annulets, or sugar rings, and as he lifts the inverted board from the smooth starch, we see that it is covered with molds of these indented rings placed at regular intervals, and as close together as they can go. Another workman now approaches with a tin receptacle filled with sugar, fitted with six spouts. With great skill and knack he pours out the sugar, and fills ring after ring indented in the starch, as fast as his arm can conveniently travel from left to right. Not a drop is spilt, the sugar standing in each ring with a slightly curved surface, just as a drop of water would do that had fallen upon dust. These starch molds are used for all those sweetmeats which contain fluid or liquor in the interior. The liquor is mixed with the melted sugar indiscriminately, and both enter the mold together, but, curiously enough, the latter instantly crystallizes on the outside of the former, and thus, by a natural law, the liquid, flavoring essence becomes imprisoned. It was thought very foolish of George III. to ask how the apples got into the dumplings, but we have little doubt that the manner in which these liquors get inside the sugar plums has puzzled many a head wiser than his. The casting of these liquor sweets employs a large number of persons, and the most extraordinary molds are obliged to be invented to meet the requirements of the trade. Balmoral boots, Tyrolese hats, scissors, knives, fish, and all kind of things, animate and inanimate, are thus produced, the only limit to the design being the size and weight of each article."

Correspondence

Effects of the Earth's Rotation.

Messrs. Editors:—In the "Annual of Scientific Discovery," for 1864, page 82, article, "Effects of the Earth's Rotation," it is stated that the effect of the earth's rotation on a projectile pointed north will cause a variation toward the east, but when pointed toward the south the variation will be toward the west. It is also stated, as a result of the same cause, that the right hand wheels of carriages on railroads running north and south will be most worn. Can it be that these statements are correct? Would not the force of rotation be in some measure lost during the passage of the projectile? and, the earth continuing to move, would not the projectile strike the earth, whether it was projected toward either the north or the south, with a variation from its intended object toward the west? C. M.

South Boston, Sept. 19, 1865.

[The earth's rotation carries bodies at the equator from west to east at the rate of about seventeen statute miles per minute, while in this latitude, the distance round the earth on a parallel of latitude being less, the motion is at the rate of not more than twelve miles per minute. Consequently, if a cannon ball were fired from the equator to New York, when it reached this city it would be going eastward five miles per minute more rapidly than bodies here; its deviation, therefore, in relation to these bodies, from a north course, would be to the eastward. On the contrary, if the ball were fired from New York to the equator, it would there find the surface of the earth running around toward the east five miles an hour more rapidly than itself, and its duration in relation to this surface would be westward. This principle has been cited to explain the westward course of winds approaching the equator—the northeast and the southeast trades—and the eastward deviation of the Gulf stream as it runs toward the north.—Eds.

Fresh Water Apparatus.

Messrs. Editors:—In your issue of 23d inst. I notice an article in relation to an improvement on my "Fresh Water Apparatus," patented by Thomas Callan, of Philadelphia, which is so erroneous in detail that I ask leave of you to correct the same, as the description of my invention, as therein set forth, is so entirely wrong that it may work to my injury among the parties that require such an apparatus.

I suppose, from the wording of your article, that Mr. Callan's improvement relates to my patent "refrigerator," instead of a "condenser," as set forth in his claim as patented.

My refrigerator is intended to cool the injection water from a condensing steam engine—the engine having the ordinary jet condenser, air pump and hot well—the water of condensation and the condensing water being brought by the air pump to the hot well, the amount of water of condensation (being the water produced by the steam exhausted from the cylinder) is returned back to the boiler, the amount of condensing water is taken into the refrigerator to be cooled, to be taken back to the jet condenser, to subserve its purpose anew of condensing the exhaust steam. As both these quantities are constant (minus leakages), the first requires to be taken back to the boiler to preserve the proper head of water there, and the other to be taken to the refrigerator to supply the amount of water taken from it to the jet condenser.

The exhaust steam from the cylinder *does not* reach the refrigerator—the water produced by the condensation of that steam being mingled with the injection water, and the amount thereof being taken off from the hot well to the boiler.

It would be a matter of utter impossibility to use this water for the injection, for the reason that it is too limited in quantity, as the water of injection requires to be from fifteen to thirty times the quantity of the water of condensation—dependent upon the pressure of the steam used in the cylinder—and for the further reason that *all* the water of condensation, or the amount thereof, requires to be returned back to the boiler.

My apparatus *does not* require to be made very "long and expensive" to produce its proper effect. It occupies less space, and costs less, than any other apparatus heretofore devised for the purpose, in proof of which I can furnish you, or any party interested, abundant testimonials.

As my only object in this communication is to be set right before the readers of your journal in relation to my invention, I trust that you will favor me with its insertion. William A. Lightball.

No. 5 Bowling Green, N. Y., Sept. 23, 1865.

Machinery Wanted for Texas.

Messrs. Editors:—We are about raising a company to go to Texas for the purpose of raising sugar on a large scale, and would like to have you inform us which is the best firm to procure engine and boilers of—say, 150 horse-power, smoke-consuming apparatus with the best method of saving fuel, as wood is of great scarcity, and coal not procurable at any price. We will want vacuum pans and the very best of purifying apparatus; in short, a modern first-class sugar house, capable of manufacturing from 1,200 to 1,800 hogsheads of common sugar. We want a horizontal and roller mill. If you can inform us where to procure such machinery you will confer a great favor. W. R. Atherton.

Steuben, Huron Co., Ohio.

[By publishing Mr. Atherton's letter we make his wants known to the great mass of the manufacturers of machinery throughout the country. The communication is evidence of a movement southward, which we have other evidence is going forward on a large scale. There was never a time when manufacturers of machinery of all kinds found it so profitable to advertise their business.—Eds.

FOREIGN SUMMARY.

New Rotary Steam Engine.—Mr. R. W. Thompson, F.R.S., described a new rotary steam engine, in which the difficulties arising out of the use of the stop or abutment are got rid of, by dispensing with the steam stop entirely; and in which the inconvenience connected with keeping the packing steam tight is obviated by giving the packing straps the same curvature as the inside of the cylinder, causing them to bear equally and steadily against the steam, as in the packing of an ordinary piston. Mr. Thompson exhibited diagrams and wooden models of the engine. He said, from the experience he had in connection with the new engine, he believed that for many purposes it would supersede the ordinary form of steam engine. The engine, when manufactured under the same advantages as those under which the common engine was now produced, would be turned out at a cost less than half that of an ordinary engine. Gas exhaustives, constructed on this principle, acted with an efficiency exceeding that of any of the machines hitherto in use. One had been in operation at the Edinburgh and Leith Gas Works for some time, and it went with much less power, and discharged a much greater percentage of gas than any of the machines hitherto in use. A few remarks from several members followed the reading of the paper, after which Mr. Thompson received the cordial thanks of the section.

Silicium in Iron.—In a recent paper, Dr. Phipson of England, said it was well known that silicium existed in cast iron, not only in the free but also in the combined state. Dr. Phipson had been led to examine the subject of silicium in iron from the fact that he found several samples of iron which were reported as yielding very different qualities of Bessemer steel, to be of precisely similar chemical composition, and following up the subject, he came to the conclusion that the difference in the quality of steel arose, not from differences in the total quantity of silicium, but from the manner in which it occurred, as free or combined. This matter was of great importance, as the author was now enabled to determine, by ascertaining the amount of combined silicium, as to the suitableness

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of an iron for the manufacture of Bessemer steel, that iron which yielded the smallest quantitiy of combined silicium being most suitable for this purpose.

Mr. Abel said that had Dr. Phipson been present, he would have been glad to have heard in what manner that gentleman distinguished between combined and uncombined silicium.

Capt. Noble stated that no iron was so deficient in tensile strength as hematite iron, but he had determined that this weakness was not due to the silicium the metal contained.

In reply to a question by Dr. De la Rue, Mr. Bell stated that borax—an element very closely allied to silicium—had not been found in any analysis of iron, and that the character of an iron would vary very much, although precisely similar materials were used in its production.

Dr. Miller suggested that the spectroscope should be used, in order to determine the presence of barium, the lines given by this element being very characteristic.

A Dwarf Engine.—One of the most curious articles of the Wakefield Exhibition is, perhaps, a steam engine and boiler in miniature, and described as the "smallest steam engine in the world." It stands scarcely 2 inches in hight, and is covered with a glass shade. The fly-wheel is made of gold, with steel arms, and makes 7,000 revolutions per minute. The whole engine and boiler is fastened together with 38 screws and bolts, the whole weighing 14 grains, or under $\frac{1}{4}$ ounce. The manufacturer says of it that the evaporation of 6 drops of water will drive the engine 8 minutes. This piece of mechanism is designed and made by a clock manufacturer at Horsforth.—*London Mining Journal.*

[This is much larger than the steam pump, consisting of a steam and water cylinder, made by Charles Fichtel, of Philadelphia, in 1860. This pump was auxiliary to a model of a steam fire-engine. The steam cylinder was one eighth of an inch in diameter, and the whole affair would go into a common thimble.—Eds. Sci. Am.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Artificial Dentures.—The object of this invention is to facilitate the operation of securing or fastening artificial teeth to a base of vulcanite or other plastic or fusible material. In order to effect this purpose the teeth are provided on their inside or back part with a rim, which is perforated with round, square or oblong holes, and furnished with dovetailed cavities, extending from the inside of the gum back to the extreme edge of the rim; the bottom of said cavities grading down from the rim to the gum. The extreme edge of the gum is also perforated with holes similar to those in the rim, and pins which are straight, bent or headed are inserted into the dovetailed cavities in such a manner that, by the combined actions of the perforations, dovetailed cavities and pins, the base is firmly united with the teeth and the gum, and the danger of cutting through and exposing pins in finishing up is entirely avoided. S. C. Taylor, Monroe, Mich., is the inventor.

Machine for Finishing Hats.—This invention consists in new and improved machinery and devices for finishing hats, whereby much of the manual labor now required is performed by mechanical means. The hat blocks are set on spindles, arranged around a common center with the irons, the arms of the irons being hollow. The hat blocks have a pulley set centrally in their bases, to operate the cord which binds the hat on the block. The cord is double, and passes from the pulley through one side of the block at its base, and the hat is perforated near its brim, to let the cord pass through—the cord being then divided or opened into a loop, which is stretched over the hat—and the pulley is then wound up by a wrench, a ratchet in the hub of the pulley being engaged by a detent, in order to keep the pulley from running back. The arms on which the irons are mounted all belong to one system, and are capable of vertical motion on their axes; and they are so mounted on their axes as to be capable of yielding upward when passing over an uneven surface below them, as when going over a crooked brim. Each iron is hollow, and is capable of revolving on its arm. Beyond the irons, on each arm, is a "lurer," capable of turning on the arms, and which has at one side a sponge for wetting the hat, and at the other an elastic or flexible rubbing surface. Roche & Stewart, Williamsburgh, N. Y., are the inventors.

Surgical Apparatus for Exsections.—The object of this invention is to provide an apparatus to be worn by those who have suffered exsections of the shoulder joint, os humeri, elbow joint and radius, or either of them, or of portions thereof, whereby the functions of the arm, are, in a main degree, restored, and the patient is enabled to perform most offices of usefulness and convenience to himself and others. It has been common hitherto, whenever a patient has suffered the loss of any of the bones or joints of the arm, or of the shoulder joint, or whenever it has been thought necessary that any of them be removed, to amputate the arm, for the reason that the foundation and support of the muscles having been removed, they were, thenceforth, not able to fulfill their functions, and, therefore, the better course, was to remove the arm itself below the place of exsection or destruction of the bone, as being a useless appendage. This invention is meant to save the patient from amputation, and to provide an artificial substitute, so to speak, for the bones and joints destroyed or exsected. E. D. Hudson, M. D., Clinton Hall, Astor place, New York City, is the inventor.

Fruit Jars.—This invention consists in using upon the mouth of the jar, can or other article in which the preserved fruit is placed, a secondary vessel or receiver, the joint being made air-tight, in any proper manner, into which receiver when so attached a sufficient quantity of the fruit from the jar is placed, by opening its cover—the air first having been exhausted from the receiver by any suitable mode, so as to produce a vacuum in it, whereby the receiver can be charged with the fruit without the air coming in contact with it, after which the cover of the jar is closed, and the receiver with the fruit then detached from the preserve jar; the fruit remaining in the jar, thus being kept as pure and sweet as if none of it had been removed. Allen Sherwood, Auburn, N. Y., is the inventor.

Smoking Pipe.—This invention consists in the use in a tobacco pipe of a perforated disk or diaphragm arranged below the smoke passage leading from the bowl to the stem, and in such manner that the smoke will come in contact with the said disk or diaphragm (which is made of metal) before entering the stem, and thus be cooled and caused to deposit the nicotine and other poisonous matter it may contain upon the said plate, the same running through the apertures therein, to be caught and retained in a nicotine chamber below the bowl of the pipe, from which it can be removed at pleasure. This pipe possesses the advantage of extracting the nicotine, etc., from the smoke without compelling it to pass through a nicotine chamber, which latter is often so foul that it infects the smoke instead of purifying it. The draught of the pipe is in no wise interfered with, and all the metallic parts can be readily removed from the pipe in order to clean them. The inventor of this improvement is Edwin Hoyt, of Stamford, Conn.

Hand Spinning Machine.—This invention has for its object the improvement of the hand spinning machine commonly called the railroad wheel, in which the spindle is mounted on a carriage that travels to and fro on the frame. It consists, among other things, in shortening the bench, changing the position of a portion of the gearing, placing the treadle so that it is operated from the end of the frame instead of from the side, providing a box to receive the carriage, etc. Jesse Byrkit, Fairfield, Iowa, is the inventor.

Paddle Wheel.—This invention relates to a new and improved paddle wheel, or that class which are provided with feathering buckets, and it consists in a novel and improved means for operating the buckets, and in an improved construction and arrangement of certain parts pertaining thereto, whereby several advantages are obtained over other paddle wheels of the same kind. James Burson, of Yates City, Ill., is the inventor.

Ruffler and Gatherer.—The object of this invention is to produce an apparatus, to be used upon a sewing machine, for the purpose of making ruffles and gathers in cloth. It consists in an upper and lower spring plate, which tend constantly toward each other, and which come in contact with spur wheels that are geared together by means of an intermediary wheel. When two pieces of cloth, one of which is to be gathered, are to be united by sewing, one of them is placed between the lower spring plate and its wheel, and the other between the upper plate and its wheel, and when the cloth is fed along, the upper gear is made to rotate by reason of the pressure produced on the cloth by the upper spring plate, and the lower gear, by reason of the small intermediate gear, is made to revolve at a higher speed, and thereby ruffle and produce gathers in the cloth which is held against it by the lower spring. Leonard C. Riggs, Florence, Mass., is the inventor.

Clamp for Boot-crimping Devices.—The object of this invention is to obtain a clamp for boot-crimping devices which will not injure or tear the leather while the same is being stretched or drawn over the tree. To this end the invention consists in inserting in the sides of the clamp which grasp the leather pieces of wood, gutta percha, or other material, which, on account of its softness, will not injure the grain of the leather, and still be firm enough to grasp it securely. Edward Simmons, of South Providence, R. I., is the inventor.

Thill Coupling for Vehicles.—This invention relates to a new and useful improvement in couplings for attaching thills to the axles of wheel vehicles, and it consists in attaching a spring catch or fastening to the pin of the ordinary thill coupling, and having a recess made in one of the ears, between which the thill iron is fitted to receive the spring catch; all being arranged in such a manner that the pin, which passes through the eye of the thill iron and the ears on the axle, will be held in position or prevented from casually passing out of place, and also prevented from turning. H. K. Waterhouse, Factory Point, Vt., is the inventor.

Brick Press.—This invention relates to a new and improved brick press, of that class in which a screw or auger is employed for forcing the clay into the molds. The invention consists in constructing the screw or auger with a concave flange, the concave surface being at the face side of the flange, whereby the clay, as the screw or auger rotates, is gathered toward the center of the box in which the screw or auger works, and the latter rendered far more efficient in its operation than those hitherto used. The invention also consists in arranging the screw or auger directly under the mud mill or clay-tempering box, whereby the machine is greatly simplified. The invention further consists in the employment or use of a jointer, arranged with a spring, and in connection with the mold cylinder, in such a manner as to face or smooth off the clay in the molds in a perfect manner. John J. Alvord, Tecumseh, Mich., is the inventor.

Oil Can.—This invention relates to a new and useful improvement in oil cans, such as are used for lubricating machinery and for like or similar purposes, and are provided with an elastic bottom for ejecting the oil from the can. The invention consists in the employment or use of a wire or rod attached to the elastic bottom, and extending through the spout or nozzle, for the purpose of preventing the clogging or choking up of the same. The invention also consists in the application of a valve to the rod to regulate the flow or discharge from the can; and in a bell-shaped terminus for the spout or nozzle to prevent the drip of oil from the same from running down the outer side of the can. Henry E. Stager, Milwaukee, Wis., is the inventor.

Steam Jets.—It may be interesting to know that the application of the steam jet can be traced back to the time of the ancient Romans. Ewbank, in his work on "Hydraulics," gives some interesting particulars on the subject, and shows that blowing fires by a jet of steam, either into the fire or up the chimney (like the modern (?) steam jet), is of very ancient application.

All applications for admission to the Paris Exposition of 1867 must be made before the 31st of October, 1865. The application must be accompanied by a description of the articles to be presented.

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Twist Drills, Collets and Chucks,

For many years twist drills have been made by machinists for the purpose of constructing fine, delicate machinery when exactness was absolutely necessary to carry out the ideas of inventors and mechanics. The old-fashioned tedious method of forging, twisting, centering, turning and filing into shape —made a drill of half-inch in diameter cost from $2 50 to $3 50; even at that price it was considered cheap, as it did work which could not be performed by any other drill. To cheapen the cost of production, many of our best machinists who carried on business largely, got up small fixtures attached to lathes to cut the grooves in the drills after they were turned, and then finished them as usual by hand. Thus each company were obliged to make tools first before they could make drills, and then could only make a limited number of sizes. Here, then, was a demand for a new business, and Mr. S. A. Morse, of East Bridgewater, Mass., perceiving it, set about the invention of a machine which should take a piece of steel turned to size, and complete a drill ready for hardening, almost at one operation. This was effected in May, 1862, when he produced a drill upon which he obtained a patent; the features are a groove so cut or formed as to present a straight cutting edge to the metal, with a decrease in the angle of the groove as it advances towards the shank, the groove being a taper from near the point to the shank; at the same time the width of the groove is increased in the same direction in order to give as great capacity for borings at any point in the drill as there is at the cutting end, while the drill is thus made stronger as the groove advances. The small drills are made from Stubbs's steel wire, including all the sizes of his steel wire gage. Some gages have 80 sizes. The larger drills, from three-eighths to one and one-fourth inches, are made from the best cast steel, with taper shanks turned to fit sockets, which are so made as to be readily fitted to any drilling machine or lathe.

The steel-wire gage, as is well known, embraces 60 different sizes, from 4-100 to 23-100 of an inch. It was, therefore, important to have a tool that would hold all and each of these drills without any loss of time in adjusting them firmly and always true to the center.

The self-centering collet, patented May 4, 1864—an engraving of which is shown in Fig. 1—was designed and is manufactured by the Morse Twist Drill and Machine Company. This collet is made entirely of steel, and consists of only six pieces—the body, A, with slot, B, jaws, C and D, cam ring, E, plate, F, and screws, which hold the arm to the chuck. The jaws are accurately fitted to the slot, B; one is V-shaped on the inside, and the other fits into it; both are countersunk on the outside edge, so that when the conical end of the drill (see Fig. 3), is pressed against them, they will be easily pressed apart to receive it, thereby doing away with springs, which, on account of their liability to break, are objectionable. The cam ring fits over the body, A, and closes the jaws by being turned half round. This will hold the drills tight in most cases, if set up with the hand, but there is a wrench fitted to the chuck to be used as needed. The plate, F, covers the end of the body and jaws, and secures the latter from motion in that direction by means of the screws before mentioned. To fasten this tool to the lathe, a mandrel must first be fitted to the spindle and turned on the outer end to fit the hole in the shank, G, of the chuck.

Fig. 2 is a cheaper adjustable chuck for holding drills from one-sixteenth to one-half inch in diameter. It is constructed like the others, except in the place of the cams there are two screws, A, to adjust the drills in the center; a wrench for the screws accompanies the chuck.

These drills are first-class tools in all respects; they drill a round hole to the shank without removing them from the work. Metal workers know that there is nothing more obstinate or annoying to drill than a composition of copper, tin and lead; this catches every sharp-edged tool which works in it, but we have found these drills to run through it with ease, removing the metal in long spiral shavings, without being heated or clogged. If a drill will work in this metal, it will in anything, and the celerity with which a hole is bored through cast or wrought iron, is surprising. These are first-class goods, and are now in use in most of our large shops, armories and private establishments throughout the country. They are now manufactured at New Bedford, Mass., by the Morse Twist Drill and Machine Co. All sizes of drills up to half-inch always on hand. The larger sizes and chucks furnished in small quantities at present; the company will soon have facilities, however, for furnishing all sizes as ordered. All orders should be addressed to S. A. Morse, Superintendent of the Morse Twist Drill Co., New Bedford, Mass.

Fig. 2

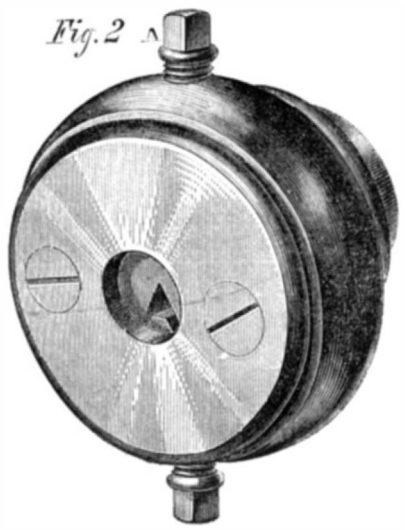


Fig. 1

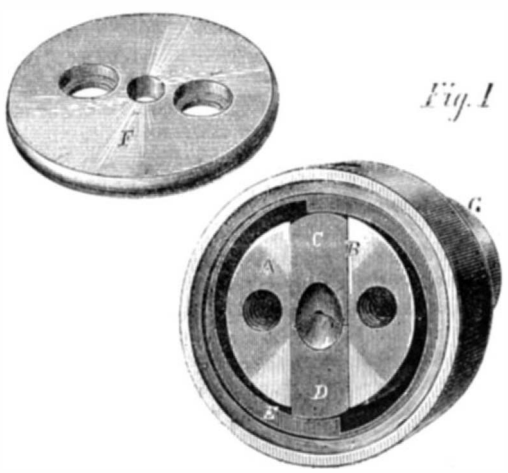
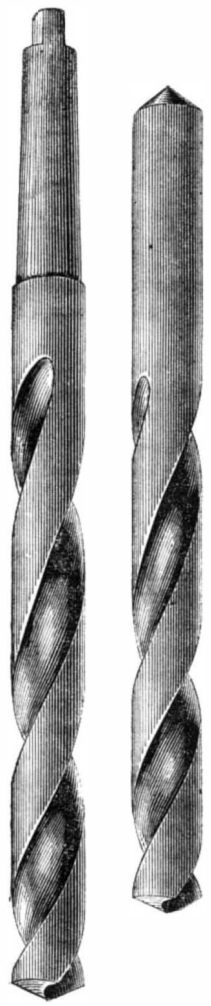


Fig. 3.



MORSE'S TWIST DRILLS, COLLETS AND CHUCKS.

BARNES'S CRAVAT HOLDER.

This invention is designed to relieve an annoyance common to the newly-invented paper or other garrote collars and the thin flimsy cravats so generally worn. Individuals who bedeck their persons in these attractive articles, are frequently humiliated and embarrassed by finding the cravat and collar endeavoring to change places—one surmounting the other. By the use of a simple ornamental appendage—shown in the engraving, the cravat and collar can be used as man and nature intended them to be.

Fig. 1

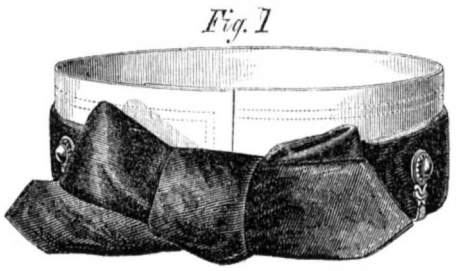
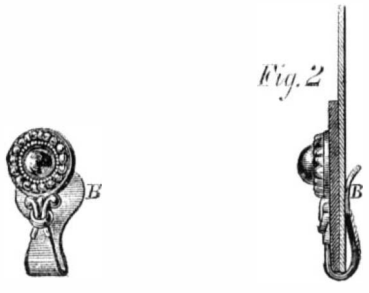


Fig. 2



This appendage consists of a pin, A, formed with a spring back, B, so that when it is applied, as shown in Fig. 2, section, both the cravat and collar will be caught and firmly held. This pin is applied at either side of the bow, where it presents a highly unique appearance. With this attachment, no solicitude is caused, and bashful gentlemen may keep their hands off their clothing when in the presence of ladies, in perfect confidence that all is as it should be, and that they do not present a ridiculous spectacle by reason of the annoyance fully set forth previously.

This invention was patented through the Scientific American Patent Agency June 27, 1865, by W. S. Barnes. For further information address Barnes & Robinson, Providence, R. I.

MARKET FOR THE MONTH.

The prosperity mentioned last month continues, but there are signs of a gradual extension of credits. Some stocks, especially that of cotton, are accumulating, and there has been a check in the demand for cotton goods, which has caused a material fall in the price.

	Price Aug. 30.	Price Sept. 26.
Coal (Anth.) ₩ 2,000 lb.	$9 50 @10 50	$12 00 @12 50
Coffee (Java) ₩ lb.	26 @ 26½	29 @ 30
Copper (Am. Ingot) ₩ lb.	30½@ 32	32½@ 33¼
Cotton (middling) ₩ lb.	44	44 @ 45½
Flour (State) ₩ bbl.	$6 80 @ 9 25	$7 60 @ 8 35
Wheat ₩ bush.	2 10 @ 2 40	2 15 @ 2 50
Hay ₩ 100 lb.	60 @ 70	60 @ 65
Hemp (Am. drs'd) ₩ tun.	270 00@300 00	325 00@350 00
Hides (city slaughter) ₩ lb.	10 @ 10½	11½@ 12
India-rubber ₩ lb.	47½@ 70	36 @ 70
Lead (Am.) ₩ 100 lb.	9 25 @ 9 30	9 50 @9 62½
Nails ₩ 100 lb.	5 50 @ 6 00	8 00
Petroleum (crude) ₩ gal.	32	38 @ 38½
Beef (mess) ₩ bbl.	8 00 @14 50	9 00 @15 50
Saltpeter ₩ lb.	22	22
Steel (Am. cast) ₩ lb.	13 @ 22	13 @ 22
Sugar (brown) ₩ lb	11 @ 16½	11¼@ 17½
Wool (American Saxony fleece) ₩ lb.	75 @ 77	75 @ 77
Zinc ₩ lb.	13½@ 13¾	14 @ 15
Gold	1 44	1 44
Interest (loans on call)	4 @ 4	5 6

In Leiperville, Penn., there is a quarry so deep that when a teamster calls to his oxen a spectator on its bank hears nothing. A stone cast from the same bank occupies thirteen seconds in descending.

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THE

Scientific American.

MUNN & COMPANY, Editors & Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

VOL. XIII. NO. 15...[NEW SERIES.]...*Twentieth Year.*

NEW YORK, SATURDAY, OCTOBER 7, 1865.

☞ Messrs Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill London, England, are the Agents to receive European subscriptions for advertisements for the SCIENTIFIC AMERICAN. Orders sent them will be promptly attended to.

☞ "The American News Company," Agents, 121 Nassau street New York.

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OUR ROLL OF HONOR.

Almost down to the present century the writers of literature have depended for support upon the patronage of kings and nobles, and their productions have consequently been filled with sycophantic praise of their patrons, with arguments in defense of royal and aristocratic forms of government, and with denunciations of opposing systems. Hence the repetition from century to century of the saying: "Republics are ungrateful"—a saying contradicted in different lands and times by the most conspicuous events of history. The maxim has been uttered with great bitterness by many disappointed politicians, who have sought to use their position in republics for the gratification of their personal ambition; but all, in every age, who have served any community with disinterested public spirit, have awakened in the people emotions of gratitude such as, in the constitution of human nature, it is impossible for kings or nobles to feel. With what filial affection did the people of Athens obey, through long years of unexampled trial, the paternal advice of Pericles! In the long roll of those who have filled the kingly office, what man has shown such gratitude as that which was manifested by the whole people of Syracuse to the devoted and noble Timoleon? What subject ever received from his sovereign such evidences of grateful love and remembrance as those which surrounded the heroic life and followed the bloody death of the first William of Orange? Among the inhabitants of Europe, the people of strongest emotions are they whose homes are nestled in the mountain dells of Switzerland; and the warmest feeling of their hearts is gratitude for the service of Tell. The homage of the people of this country to the memory of Washington, the gifts of fortunes and houses to Farragut, Grant, Sherman and other officers, and the enormous subscriptions to the Sanitary and Christian Commissions for the benefit of our soldiers, are not proofs of peculiar generosity on the part of Americans, they are manifestations of the gratitude which has always characterized democratic communities toward those who have served their country faithfully and well—a quality diametrically opposed to the lying maxim that has been so often and so thoughtlessly repeated.

We are reminded anew of the falsehood of this maxim by the receipt of a pamphlet from the War Department, entitled: "Roll of Honor. Names of Soldiers who Died in Defense of the American Union, Interred in the National Cemeteries at Washington, D. C., from August 3, 1861, to June 30, 1865."

No longer ago than the time of Frederick the Great there were no medical departments in the organization of armies. Sometimes, when a soldier was wounded, his commanding officer would cut off his leg and sear the stump with a red-hot iron to stop the bleeding; but, generally, if a man was permanently disabled, it was considered best to let him die, in order that the kingdom might not be cumbered with his support. The care which our private soldiers have received has not been, indeed, all that they deserved, but it was the tenderness of maternal love compared with that which has ever been bestowed upon the common soldiers of any other army. This care ceases not even with the termination of life, but smooths the pillow of their last repose, and transmits to their relatives all that affection would know in regard to their final resting place.

"On fame's eternal camping ground
Their silent tents are spread,
And glory guards, with solemn round
The bivouac of the dead."

PURE ALCOHOL FOR BRANDY PEACHES.

Mr. Moore, who owns a distillery situated at the corner of Thirty-ninth street and Tenth avenue, in this city, says that he has drank imported French brandy, direct from the bonded warehouse, which was proved to his satisfaction to have been distilled at his establishment. The corn whisky was bought of him at 55 cents per gallon, sent to France and doctored by the addition of sundry drugs and by other manipulations, and then returned to this country and sold as genuine French brandy at $6 per gallon.

The essential ingredient of all ardent spirits is alcohol. In addition, they all contain a large proportion of water, and a very small proportion of essential oils, which give them their peculiar flavor. If the spirit is leached through animal charcoal, these oils are absorbed by the charcoal, and the spirit comes out white and nearly tasteless. There is, however, a foreign substance that is not absorbed by the charcoal, this is fusel oil or amylic alcohol. It is a colorless liquid, of a peculiar, nauseous, suffocating and most persistent odor, and of an acrid taste. As the boiling point of fusel oil is 270°, while that of alcohol is only 168½°, it is easy to separate the two by distillation.

When the peculiar flavor of brandy is required, it must be taken before the rectification with charcoal, but in brandy peaches the flavor is given by the fruit, and for this purpose the purer the alcohol the better. At the Boston Distillery, 122 Elm street, in this city, and probably at other distilleries, a very pure article is sold under the name of spring water spirits. It is alcohol subjected to a second distillation after the rectification by charcoal, in order to eliminate the fusel oil. This spirit is purchased by grocers, diluted by adding its own volume of water, and sold under the name of white brandy, expressly for making brandy peaches. It is most suitable for the purpose, and we should suppose would be most suitable in any case where alcohol in any form is to be taken into the stomach. We believe it is generally prescribed by the homeopathic physicians, and there seems to be no reason why it should not be adopted by the profession generally whenever alcohol stimulus is indicated.

Except under the advice of a physician, it is doubtless best to avoid the use of alcohol in all its forms; but, damaging as it is to the system, it is probably less so than the poisonous drugs with which it is mingled to convert it into "French brandy."

BOILERS OF THE IRON-CLADS.

There are a mile and a half of iron-clads now laid up in the Delaware River, at League Island—a mile and a half of war ships whose ports are closed, whose guns are silent, from whose escape pipes no steam curls upward to the air. These vessels, which have done the country so much service, are practically dismantled, and left to rest in peace until they are again needed.

To the dreamer, the sight is suggestive, but the mind of the practical man instantly reverts to the mechanical details, and to the preservation of them intact. As to the engines of these iron-clads there is no cause for anxiety, but, in regard to their boilers, there is apprehension. Engineers know very well that when a ship is laid up idle the boilers are ruined in a short time, unless great care is taken and constant supervision given. With all the precaution, it not unfrequently happens that tubes have to be cut out of vertical flue boilers and renewed. The condensed moist air, or "sweat" which collects on the tubes is the cause of this injury, and a remedy for it would save a great many dollars to ship-owners and the country.

It is customary, in some cases, to kindle a fire in the furnaces with the hope of dispelling the moisture by drying it off. This may be a temporary, or an apparent, remedy, but it is of no value, and even if the flues are not removed by reason of corrosion, their endurance is greatly impaired, and the life of them, so to speak, shortened. Where scale deposits at the bases of the tubes then the danger of destroying them is greatly augmented, for the hygroscopic nature of those salts of lime that constitute scale causes them to absorb moisture, which furrows the external surface of the tubes like cutters.

What course has been taken with the boilers of the iron-clads we do not know, but it is probable that they will receive such attention as the nature of the case demands. Cylinder boilers that are blown out are easy to preserve by a coating of oil, but in vertical or horizontal tubular boilers, where the spaces are so small that one can hardly get a finger in, it is a difficult thing.

THE FLOW OF SOLIDS UNDER PRESSURE.

The most common mode of making lead pipe, is to melt the lead and run it into a massive cylinder, which has a hole in the bottom corresponding in size to the external diameter of the pipe; to the cylinder is fitted a solid plunger piston, which has a steel spindle, equal in diameter to the interior bore of the pipe, projecting from its lower end downward through the center of the die in the bottom. So soon as the lead has cooled sufficiently to become solid, but while yet very warm, the piston is forced downward by a powerful hydraulic press, squeezing the lead through the annular opening, and forming the pipe. A better form of the apparatus is to have a hole through the piston and let the spindle or core rise up through this hole from the bottom of the cylinder; on applying the pressure, the lead rises upward through the annular opening and flows over in an endless pipe. With this form of cylinder, pipe may be made from perfectly cold lead, and even from the still harder metal, block tin. Tin, indeed, can be worked only in the cold state, as it crumbles to pieces like sand if manipulated while hot.

It is manifest that the particles of the metals, when pressed through these openings, must slide upon each other in precisely the same way as the particles of water, or any other liquid, while flowing through similar openings. The resistance to motion in relation to each other of the particles of a liquid and those of a solid, seems to be merely one of degree. When the form of a bar of iron is changed, by either hammering or rolling, the particles must slip one over another, though they are not separated sufficiently to destroy their cohesion for each other.

This is an instance of the fading into each other of all divisions in nature. Nothing could seem more sharply defined than the distinction between solids and fluids; but if we change the conditions, if we subject the solid to sufficient pressure, it is found to flow through narrow openings, like the most mobile liquid.

SALES OF PATENTS.

More money is being paid, at the present time, for valuable patents, than ever before. In our reports of the Fair of the American Institute, on another page, will be found a mention of the French self-fastening button; we are told by the capitalists who bought the patent of this little invention, that the sum paid for it in cash was $125,000.

An ingenious inventor in Ohio has recently made an improvement in machinery for cutting nails. It is stated very directly from the inventor that he sold one-half interest in the patent for $10,000 in cash, and the purchaser says that he has been offered $80,000 for it.

A clergyman of our acquaintance has been offered $50,000 for the United States patent in an invention we lately secured for him in this country and Europe.

Another of our customers has been offered $30,000

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for a patent in a machine for making hats, recently issued; and almost every day cases are brought to our knowledge of patents being sold for large amounts.

The Naval Trial---Report of the Experts.

NEW YORK, Sept. 26, 1865.

SIR—In obedience to your orders of the 26th of July, for the competitive trials of the machinery of the steamers *Winooski* and *Algonquin*, to test the relative economy of fuel and power, we would state that the trial commenced on Friday, the 22d instant, and we respectfully make the following report:—

Though not required by your letter of instructions to report upon the trial until the completion of the same, we believe it will be of interest to the department to know at this time the result of the first trial, which commenced for the purpose of ascertaining the relative economy of fuel.

The trial commenced according to the programme of the Board of Civilian Experts. The fires were started at 10:15 A. M. of the 22d instant, were hauled at 4 P. M., and again started for the regular trial of ninety-six hours, and continued until brought to an abrupt termination by the bursting of the *Algonquin's* pipe, which necessitated the drawing of the fire from the boilers. When the accident occurred the experiment had lasted fifty-four hours and eight minutes. the whole duration was to have been ninety-six hours. Owing to this accident we cannot give the results ascertained exactly in the manner reccomended by the Board of Experts, but we can give the results as ascertained in the manner directed by your original order, and which we believe to be accurate. In that order we were directed to run the engine several hours, to bring the fires into steady action, and the machinery into proper working condition. We were then to commence the trial, noting the state of the fires. At the end of the trial, we were to leave the fires, steam pressure, water level, etc., the same as at the commencement.

At the time of the bursting of the *Algonquin's* pipe the fires under the boilers of both vessels were in good condition, and the steam pressure and water level about the same as at the commencement. We consider that at 8 P. M. of the 22d instant, the engines of both vessels having been run about three hours from the commencement of the trial; the fires were in steady action, and the machine.y in proper working condition.

From this time to 11 P. M. of the 24th instant, a few minutes previous to the breaking down of the *Algonquin's* engine, is fifty-one hours, the mean results of which are as follows, namely:—

	Winooski.	*Algonquin.*
Total time of trial in hours	51	51
Total number of revolutions of wheels	45,149	44,918
Total number of pounds of anthracite	80,400	79,239
Average number of revolutions per minute	14,754·6	14,679·1
Average number of pounds of coal per hour	1,576·5	1,553·7
Average pressure of steam in boilers	16·8	70.79
Average point of cutting off	0·475	0·111

According to the above figures obtained from the log, which was accurately kept on both vessels, the economical performance of the machinery of each was equal.

At the time of the failing of the machinery of the *Algonquin* the water in her boilers had reached a density which required "blowing off," and for the remainder of the trial she would have been subjected to a considerable loss of fuel on this account.

The *Winooski* easily runs the whole ninety-six hours without a necessity of this character. The machinery of the *Winooski* worked throughout in the most satisfactory manner, showing it to be durable and reliable. Its arrangement is the simplest and most convenient possible, and its economy of fuel equal to that given by the very complex design of the machinery of the *Algonquin*.

We are, very respectfully, your obedient servants.

Chief Engineer ROBERT DANBY,
Chief Engineer EDWIN FITHIAN,
Chief Engineer MORTIMER KELLOGG.

HON. GIDEON WELLES, Secretary of the Navy, Washington, D. C.

HON. N. O. MITCHELL'S gang of four men sawed 17,800 feet of square-edged lumber in his mill at Gardener, in five hours, one day lately. The world is invited to beat it.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING SEPTEMBER 26, 1865.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

50,087.—Keeping Oil Cool in Lamps.—John Allen, M. D., Washington, D. C.:

I claim the placing of water on the top or around the reservoir, A, as herein described, and for the purpose set forth.

50,088.—Brick Press.—J. J. Alvord, Tecumseh, Mich.:

First, In combination with a rotary mold cylinder, M, a screw or angle, L, having the face side of its spiral flange, f, of concave form, substantially as and for the purpose specified.

Second, The placing of the screw or auger, L, directly under the cylinder, D, which forms the case or box of the mud wheel, so that the tempered clay will be forced direct from the mud mill into the box, C, which contains the screw or auger, as described.

Third, The joints, T, in combination with the mold cylinder, M, and the spring, U, or its equivalent, substantially as and for the purpose set forth.

50,089.—Cotton Bed Planter.—Frank M. Bacon, Ripon, Wis.:

First, I claim a horizontal hopper, with a central discharge opening, in combination with the stiners or agitators, actuated substantially as specified.

Second, I claim the adjustable regulator, o, or the shaft, i, in combination with the hopper, m, and agitators, for the purpose and substantially as specified.

50,090.—Pipe Joint.—Phineas Ball, Worcester, Mass.:

First, I claim the combination with the end of the pipe, R R, of the hinged guide clamps, A A.

Second, The combination with the clamps, A A, of the flanges, f f, and pins, d d, substantially as and for the purposes set forth.

Third, The combination with the bottom of the clamps, A A, of the supporting pins, e e, for sustaining the lower half of the sleeve while being filled, as described.

Fourth, The combination with the overlapping parts, P and S, of the ears, g g, and screws, x x, for the purposes set forth.

50,091.—Step Ladder.—Joseph Barnett, Dayton, Ohio:

I claim the employment of the strips, a a and e e, in connection with the side piece, A A, and arranged with the slotted bar, d, and eyes. C C, the several parts being used as and for the purpose herein specified

50,092.—Hydrometric Apparatus.—Louis Brawer, Memphis, Tenn. Antedated Sept. 18, 1865:

First, I claim registering the quantity of high wine as it flows from the cooler of a distilling apparatus, by means of an apparatus which is so contracted that the registering mechanism thereof will be automatically controlled by the strength of the flowing liquor. so as to be stopped when the liquor is below proof, and started again by liquor above, substantially as described.

Second, Providing the case, A A, with an inlet pipe, a a, leading to the cooler of a still, a pipe, G, for receiving the buoy, J, and a discharge pipe, H, for conducting the liquor from the apparatus substantially as described.

Third, Providing the wheel, B, with one or more projections, p, in combination with a buoy or float, J, operating g, substantially as described.

Fourth, The combination of an alarm wheel, b, or its equivalent, with the wheel, B, which actuates a mechanism for registering gallons and barrels, substantially as described.

Fifth, Automatically controlling the testing mechanism or device by the strength of the flowing liquor, substantially as set forth.

50,093.—Cultivator.—William J. Burton, Turtle, Wis.:

I claim the bows, C C—this I claim broadly—the whole arranged as and for the purpose described and set forth.

50,094.—Hand Spinning Machine.—Jesse Byrkit, Fairfield, Iowa:

First, In hand spinning machines placing the main driving wheel outside the frame, and the intermediate wheel, B, beneath the bed of the frame, so that neither wheel shall interfere with the run of the carriage up to the driving end, substantially as shown, thereby enabling me to shorten the bench, and to run the carriage to the driving end.

Second, I also claim in hand spinning machines so placing the crank or driving wheel and the treadle for running the carriage in and out that the spinner can sit behind the end of the machine while at work, substantially as described.

Third, I also claim in hand spinning machines providing a box at the outer end of the bench to receive the carriage, substantially as described.

50,095.—Curling Iron.—Hibbard Christian, New York City:

I claim a hollow curling tube adapted to receive and retain a supply of hot water as a heating medium, substantially as set forth.

50,096.—Skate.—Selah H. Clark, Philadelphia, Pa.:

I claim the within-described skate, composed of the runner, A, and detachable foot-piece, B and B', the whole being constructed and arranged substantially as and for the purpose herin set forth.

50,097.—Machine for Making Drain Tiles.—Thomas A. Collins, Josiah D. Evans and Thomas J. Smedley, Smyrna, Del.:

First, We claim the use in a tile machine of two plungers, each operating in a separate chamber, which communicates with the mixing box, said plunger being applied in combination with a double crank, substantially as and for the purpose set forth.

Second, Casting the arms of the mixer separate, each with its distinct hub, substantially as and for the purpose described.

50,098.—Sash Supporter.—William Conner, Wilmington, Del.:

I claim constructing or arranging a sash supporter composed of a friction wedge and spring set in a box of corresponding shape with the friction or wedge, parallel to and pressing against the edge side of the sash frame, rising upward therefrom in the manner herein set forth, so that by pressing the arm or thumb rest of the friction wedge the sash is raised with ease, and upon a removal of the pressure from said arm or thumb rest the sash is held at the hight raised.

50,099.—Shutter Hinge.—Daniel G. Coppin, Cincinnati, Ohio:

I claim the arrangement of double ratchet plate, H, with the teeth, pawls or talons, E and M, upon the fixed and movable members of the hinge respectively.

50,100.—Washing Machine.—Joseph Davenport, Nessenskum, Wis.:

I claim the rubber suspended or hung from the shaft, C, by a single rod, D, which is pivoted in a shaft, F, at one end of the rubber, to admit of a lateral adjustment of the same, as well as a forward and backward movement, in connection with the concave of rollers, i, all being arranged to operate substantially in the manner as and for the purpose set forth.

[This invention relates to a new and improved clothes-washing machine, of that class in which a swinging rubber is employed, and arranged to work over a stationary or fixed washboard. The invention consists in a novel way of hanging the rubber, whereby the same is rendered capable of being operated or manipulated with the greatest facility, and in such a manner as to conform to the clothes on the washboard, and subject all parts of the clothes to a requisite degree of rubbing and friction to insure a thorough cleansing of the same.]

50,101.—Amalgamator.—Austin G. Day, New York City:

I claim the combination of a suitable fire chamber or furnace flue, A A A, or its equivalent, with the amalgamating cylinder, or its equivalent, substantially in the manner and for the purpose herein set forth.

I also claim the feeding and discharging apparatus of the cylinder, in combination with the feed of mineral and vapor of metal, as set forth.

I also claim the distributor, D, as set forth.

50,102.—Mode of Making Clasps for Hoop Skirts.—John H. Doolittle, Ansonia, Conn.:

I claim forming the clasps, or other similar articles, by means of a succession of sets of rotary dies where the strip of stock fed to the dies is divided into several parts, in the manner substantially as hereinbefore described.

I also claim forming blanks of sheet metal by one set of rotary dies, and close together, substantially as described, so that in their subsequent separation and forming up no stock is wasted.

50,103.—Apparatus for Carbureting Air.—C. M. Drennan, Boston, Mass.:

First, I claim the uneven angular or curved edges of the partitions, F, as and for the purposes herein specified.

Second, In combination with the revolving bucket wheel, I, within the closed case, A, the air pipe, G, and receiver, E, substantially as and for the purposes set forth.

Third, In combination with the closed case, A, and revolving bucket wheel, I, the removable top, C, constructed as and for the purposes specified.

Fourth, The combination of the curved partitions, F, and heads, I, with the box, U, and escape pipe, R M, substantially as and for the purposes specified.

Fifth, The combination with the receiver, E, with the valve, b, and pipes, G H g, as and for the purposes specified.

50,104.—Plate for Pressing Gunpowder.—Lammot Du Pont, Wilmington, Del.:

I claim the use of plates, made of hard or indurated rubber, for pressing gunpowder, as and for the purpose substantially herein described.

50,105.—Molding Lamp Chimneys.—Edgar Eltinge, Kingston, N. Y.:

I claim, in molds for pressing glass chimneys for lamps, forming a depression on the side, in connection with an air hole for forming a tube in the sides of such chimneys, substantially as and for the purpose specified.

[This invention relates to an improvement in the construction of molds for pressing glass lamp-chimneys, and it consist ssubstantially in providing the mold with a depression in its side, for the purpose of forming a lateral tube in the side of the chimney, opening therein at such a hight as to permit easy access to the wick of the lamp with a match or taper.]

50,106.—Combined Knife, Tweezer and Ear Spoon.—C. B. English, Springfield, Mass.:

I claim, as a new and improved article of manufacture, the device herein described.

50,107.—Steam Gage.—Hampton W. Evans, Philadelphia, Pa.:

I claim, First, Combining one or more spring rings, B', with the diaphragm spring plate, B, for increasing its strength and electricity, substantially as herein set set forth.

Second, The combination of the link, L, with elliptical foot piece, J, and toothed quadrant, M, substantially as and for the purpose above described.

Third, The combination of the spring, K, with the elliptical foot piece, J, substantially as described and for the purpose above set forth.

50,108.—Machine for Disintegrating Fibrous Plants.—Joseph Evans, Newark, N. J.:

I claim the use, for the object specified, of toothed or plain-edged screws, constructed and operated in the manner herein set forth; also the boiler, with the inside projections, when used in combination with a screw or screws.

50,109.—Steam Generator.—Edward Faron, New York City:

I claim, First, The construction of a steam boiler in which all the steam generators shall pass through the superheating tubes, as and for the purpose set forth.

Second, The construction of a steam boiler in which the generating and superheating tubes are arranged horizontally, or nearly so, and entirely within the furnace, substantially as described.

Third, The perforated plugs, J J, in the receiving ends of the superheating tubes, for the purpose of equalizing the flow of steam in all the superheating tubes alike.

Fourth, The perforated plate, K, in combination with the generating tubes and the superheating tubes, as and for the purposes set forth.

Fifth, The water guard, L, in combination with the superheating tubes, in the manner and for the purpose described.

Sixth, The arrangement of the generating tubes, B B, and the superheating tubes, C C, in such a manner as that the fire passes around the outside of both, as set forth and described.

50,110.—Composition for Cleansing the Teeth.—Eliza J. Field, Waltham, Mass., executrix of Francis Field, deceased:

I claim the within-described dentrifice, made of the materials specified, and mixed together in about the proportions set forth.

50,111.—Gas Pipe Coupling.—De Lancy Freeborn, New York City:

I claim the combination of the inner cylinder, a, and the slotted thimble, B, between which P is inserted and compressed, and the compressing thimbles, C, all substantially in the manner and for the purpose herein set forth.

50,112.—Kettle Scraper.—Ensign C. Fuller, Lowell, Mass.:

I claim the scraper described as a new article of manufacture, for the purpose specified.

50,113.—Fruit-drying Frame.—C. Gardner, Freedom, Ohio:

I claim the adjustable standard, A, hubs, D, wires, d, braces, I, and arms, C, when especially arranged and operating conjointly as and for the purpose set forth.

50,114.—Brace for Carriage Springs.—Christopher C. Gleason, Wanconda, Ill.:

I claim the specific arrangement and adjustment as described, to wit: attaching the revolving levers to the bottom of the carriage box, and attaching the braces to said lever and the front and rear axles, substantially as set forth.

50,115.—Quartz Mill.—Nathaniel Goodwin, Jr., Newburyport, Mass.:

I claim, First, The arrangement in a single case or chamber, F, of the two grinding or crushing wheels, M M, revolving toward each other, substantially as set forth and for the purposes described.

Second, In a grinding or crushing mill thus constructed, for the purposes specified, the central ridge or deflector, G, in combination with the wheels, M M, substantially as and for the purposes described.

50,116.—Bobbin for Spinning.—John Goulding, Worcester, Mass.:

I claim the combination of a metal spring or springs with the base of the bobbin, substantially as and for the purposes set forth.

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50,117.—Sewing Machine.—Charles Hale, Bangor, Me.:

I claim, First, The application to the needle thread of sewing machines of a current or blast of air, which will deflect the thread in the right direction for the formation of the loop and stitch, as herein described and shown.

Second, I claim the combination of the air pump, M, and tube, o, substantially as and for the purpose specified.

50,118.—Bed Bottom.—R. L. Hall, Lowell, Mass.:

I claim the combination of the elastic springs, b b b, the windlass, d d, and slats, a a a, for the purpose described.

50,119.—Sawing Machine.—Thomas Harper, West Manchester, Pa.:

I claim the arrangement of the drum, B, pulley, C, sliding frame, D, screw, E, pulleys, 1 2 and 3, levers, l m and n, and shifting pieces, O, the whole being constructed, arranged and operating substantially as herein described and for the purpose set forth.

50,120.—Door Bolt.—W. H. Hart, New Britain, Conn.:

I claim providing a support at the extended end of the main shaft or bolt of a Z or neck-shaped bolt, substantially as shown and described.

50,121.—Petroleum Burner for Cooking, Etc.—John P. Hayes, Philadelphia, Pa.:

I claim in a hydro-carbon burner for heating and cooking, the combined arrangement of a bent heating tube, A B, and a heating chamber, C, so constructed as to operate together substantially as described and set forth, for the purposes specified.

50,122.—Churn Dasher.—Jonas Hobbs. North Sanford, N. Y.:

I claim a churn dash, constructed of two cross bars, a a, provided with oblong openings, b b, and with inclined oars, c, attached to the outer ends of the cross bar, a, and to the dash staff, A, and provided with openings, d, substantially as herein shown and described.

[This invention consists in constructing the dash or dasher in such a manner that the air, during the process of churning, will be incorporated with the cream, and the latter subjected to a considerable degree of agitation, whereby all the butter contained in the cream will be produced in a short space of time.]

50,123.—Foot Warmer.—Hermann Hock and Jacob Zitz, Philadelphia, Pa.:

We claim, as a new article of manufacture, the foot-warming stool herein represented and described, consisting of the external case, A, upholstered hinged cover, a b B, sheet-metal water-box, D, fitting closely within the case, non-conducting lining, C, and feet, F, all as specified.

[This invention consists in a foot warmer, so made as to permit of its use in all places of exposure, as well as in sheltered places (like the apartments of a house), it being very portable and easily prepared for use.]

50,124.—Neck Yoke and Whiffletree Socket.—C. C. Holman, Clayville, N. Y.:

I claim the mode of securing the angle lever, D e, in its place, by casting the chamber socket, B b, on to it, so that the joint and the spring, E, which holds the lever, D, closed against the hook, C, will be protected, all constructed, as and for the purposes herein described.

50,125.—Breech-loading Fire-arm.—Charles Howard, New York City:

I claim, First, The combination of the plunger, P, the link, N, and the lever guard, F, said lever guard being so constructed and adapted to the other parts as to connect to the plunger by means of an opening for the insertion of the cartridge in the under side of the barrel, and also to perform the several functions of a trigger guard, a lever for operating the plunger, and a recoil block between the plunger and a fixed portion of the gun, substantially as and to the effect herein above set forth.

Second, I also claim as my improvement the plunger, made with a head screw into the back end to hold the spiral spring, and to guide the hammer rod; also, the groove in said plunger for the sliding hook to travel in, substantially as and for the purpose set forth.

Third, I claim the form of the center percussion pin, L, being formed with a large flat head fitting the whole caliber of the plunger, and covering the head of the percussion pin so that when the center pin is struck by the head of the hammer it drives the small side pin also, and also holds the small pin in its place, substantially as and for the purpose set forth.

Fourth, I claim the making of the hook and the spring that holds the hammer rod both in one piece, and of fastening the same to the upper instead of the lower strap of the breech-piece, substantially as and for the purpose set forth.

Fifth, I also claim the peculiar construction of the stirrup, K, as being made so that item braces the end of the hook, spring, hammer rod and trigger, holding the hammer rod firmly to the hook when the gun is cocked; it also pulls the rod from the hook when the trigger is pulled to fire the gun, substantially as and for the purpose set forth.

50,126.—Tank for Transporting Oil, Etc.—G. W. Howdard, Pontiac, Mich.:

First, I claim the closed tank for transporting or storing oils securely, when arranged and operating substantially in the manner described.

Second, Accommodating the expansion or contraction of oils in closed tanks by the resistance of a column of water, substantially in the manner described.

Third, The combination of the tank, cisterns and reservoir, substantially in the manner and for the purpose set forth.

50,127.—Tobacco Pipe.—Edwin Hoyt, Stamford, Conn.:

First, I claim the disk or diaphragm, C, arranged in the bowl of the pipe below the smoke passage, substantially as specified.

Second, The combination of the tube, a, and diaphragm, C, with the bowl, A, and nicotine chamber, D, substantially as shown and described.

50,128.—Surgical Apparatus for Exsections.—Erasmus D. Hudson, New York City:

First, I claim the apparatus for exsections of bones and joints of the arm and of the shoulder joint, constructed substantially as described.

Second, I also claim the scapular and saddle pad, a, for the shoulder, constructed substantially as described, and I also claim it in combination with the universal joint which connects it to the case, e, substantially as described.

Third, I also claim, in combination, the scapula and saddle pad, a, the case, e, and the joint, d, constructed substantially as described.

Fourth, I also claim, in combination, the elastic bands, P O and U, with the scapula and saddle pad, a, and as humeri case, e, constructed substantially as described.

Fifth, I also claim the thumb-piece, j, in combination with the cord or tendon, k, and the grooved elbow joint, whereby the hand is turned over when it is raised, constructed substantially as described.

Sixth, I also claim the cords or tendons, m, representing the biceps or flexor muscles of the fore arm, in combination with stanchions, n, on the frame of the elbow joint, and with the case, h, of the fore arm, constructed and arranged substantially as described.

Seventh, I also claim the flexible aponeurotic bands, f i, applied to the rigid cases, e and h, substantially as described, for the purpose of banding and confining the muscles.

50,129.—Churn.—William L. Imlay, Philadelphia, Pa.:

I claim constructing the darber of a single flat disk or wheel, set at an angle of 45°, or thereabout, to the axis of the shaft by which it is rotated, the body of the churn having such length and diameter that the oblique disk sweeps near the inner surface of both end and side, as and for the purpose specified.

50,130.—Machine for Dressing Wagon Wheels.—Silas T. Jackson, Sheboygan Falls, Wis.:

I claim the combination of a bearing wheel, D, planers, G, and smoothing disks, I, operated and operating substantially as and for the purpose set forth.

50,131.—Washing Machine.—Wm. Jackson and Frank Robinson, New York City:

We claim the combination with a corrugated or roughened board, A, of the rubbing surface, H, grooved roller, G, and handle, F, mounted in a sewing frame, the whole constructed and operating substantially as described and specified.

50,132.—Manufacture of Spirits of Turpentine.—John Johnson, Saco, Me.:

I claim the employment and use of water, steam, air, or gases and solvents, when circulating around, among and through wood, timber or lumber, in proper receptacles, at a temperature sufficiently low to receive the exhaustive terebinthinate and resins free from empyreumatic odors.

I claim the mode of procuring resin and spirits of turpentine by heating the lumber or wood placed over a stratum or sheet of water, which condenses the volatile products of the wood therein, and frees the resin, when the same is used in combination with the seasoning of lumber or timber by hot air or steam, substantially as specified.

I claim the mode of using two boilers successively for economizing the heat and avoiding waste of terebinthinate products, substantially as specified.

I claim the mode of increasing the temperature of the liquid for extracting the volatile products by the use of any suitable soluble salt, substantially as specified.

I also claim passing heated air over the surface of a liquid to, and in taking up, the volatile products previous to their entry into condenser, substantially as specified.

I claim pressing wood after steaming to eliminate the oleoresins, substantially as specified.

50,133.—Damper.—William Johnson, Milwaukee, Wis.:

I claim a damper with convex side, hollow in the center, with openings for the smoke to pass in, and a passsge for its exit, substantially as described.

50,134.—Grain Drill.—James D. Jones, Pittsburgh, Pa.:

I claim suspending the hopper or seed-box, C, on a stationary bar, x, and imparting to the hopper or seed-box an oscillating motion, the whole being constructed, arranged and operating substantially in the manner herein described, and for the purpose set forth.

50,135.—Drag Bar and Teeth for Grain Drills.—James D. Jones, Pittsburgh, Pa.:

I claim the use of the attachment plate, A, furnished with the receiving hopper, B, and used in combination with the drill, D, and distributing tube, C and e, constructed, arranged and operating substantially as herein described, and for the purpose set forth.

50,136.—Sash Fastening.—Oliver S. Judd, New Britain, Conn.:

I claim the handle, J, united to the turned button, G, by a shank, L, in combination with the spring hasp, D E, substantially as and for the purpose described.

50,137.—Mop Head.—Corydon Karr, Buffalo, N. Y.:

I claim the combination and arrangement of the jam nut, C, with the threaded collar, B, and screw shank, A, operating as and for the purposes set forth.

I also claim, in combination with the jam nut, C, and collar, B, the pivoting of the screw shank, A, in the stationary jam, D, whereby the opening and closing of the jaws may be effected by burning either the head or handle of the mop, substantially as described.

I also claim, in combination with the threaded collar, B, and screw shank, A, forming the contiguous surfaces of the jam nut, C, and collar, B, conical or of equivalent shape, substantially in the manner and for the purposes set forth.

50,138.—Coupling Shaft of Boring Tools.—Edward Kaylor, Pittsburgh, Pa.:

I claim so constructing the male screw for the joint of boring tools as that the body of the screw at the base of the threads shall be tapering from the fillet upward, while the diameter of screw at the circumference of the threads shall be cylindrical, for the purpose of strengthening the screw at its base, substantially as hereinbefore described.

The inclined eccentric bearing on the face of the male screw, in combination with the socket and its set screw, constructed substantially as and for the purpose hereinbefore set forth.

50,139.—Machine for Finishing the Cascable of Guns.—Edward Kaylor, Pittsburgh, Pa.:

First, I claim the use of a revolving cutter guided, as hereinbefore described, by means of a point pressing against that part of the face of the cascable which has been operated upon by the cutter, in combination with the tool and screw carrier for moving the cutter toward and from the axis of the gun, for the purpose of planing the cascable of guns.

Second, The use of a revolving cutter, having a guide point revolving with it and pressing against the face of a forming disk, in combination with the tool carrier and screws for moving the guide point toward the center of the disk as the cutter moves toward the axis of the gun, for the purpose of planing the cascable of guns, in any required shape, substantially as hereinbefore described; also combining in one machine the tools for ratcheting and planing the cascable—all constructed and arranged and operating substantially as hereinbefore described.

50,140.—Wheat Drill.—John F. Keller, Greencastle, Pa.:

First, I claim the above-described check link for the purpose of limiting the motion of the bar or lever, G, substantially as set forth.

Second, The arrangement and combination of the link, H, the bar or lever, G, and the boot, A, with the spring for giving flexibility to the boot and shovel, substantially in the manner and for the purposes set forth.

50,141.—Cultivator.—W. H. L. King, Princeton, Iowa:

I claim the plow beams, E E, attached to the frame, A, by means of the universal joints, F, in combination with the uprights, G G, and slide, H, and foot levers, J J, all arranged to operate in the manner substantially as and for the purpose set forth.

I further claim the pivoted frame, Q, connected to the shaft, M, substantially as shown, when used in connection with the plow beams, E E, connected to the shaft, M, and all arranged substantially as and for the purpose specified.

[This invention relates to a new and improved cultivator of that class which is provided with laterally and vertically adjustable plows, in order to admit of the latter being moved to conform to the sinuosities of the rows of plants, and also to raise and pass over them. The object of the invention is to obtain a simple device for the purpose specified, and one which may be readily operated or manipulated by the driver.]

50,142.—Mode of Sinking Well Tubes.—Chas. W. Kinne, Cortland, N. Y.:

I claim forming the opening point, F, as a part of the interior rod, B, and rising the same, in combination with the tubing, A, in such a manner that a separate point for each well is dispensed with, substantially as herein set forth.

I also claim coupling the adjustable collar, C, with the tubing, A, by means of the screw threads, a c, and connecting the said collar with the interior rod, B, by means of the set screw, g, and holes, h h, the whole arranged substantially as herein specified for the purpose of preventing the brushing of the end of the tubing and for retaining the same in place.

I also claim the arrangement and combination as a whole, consisting of the interior rod, B, with fixed point, f, tubing, A, with sharp-edged extremity, a, and adjustable collar, C, connected by the screw threads, a e, substantially as described.

50,143.—Mode of Lubricating Journal Boxes.—Joseph F. Light, Worcester, Mass.:

First, I claim the combination with the box of a journal or bearing of a tube or tubes, G, and wick or wicks, c, substantially as and for the purpose set forth.

Second, The combination with the oil cup or drip pan and lower half, A, of a journal box or bearing of a hollow supporting stem, D, and wick, c, substantially as set forth.

50,144.—Wooden Coffin.—Mahlon R. Margerum, Trenton, N. J.:

I claim the forming and constructing the sides and rounded head of wooden coffins with one single or entire piece of wood, and bending the same so as to form the coffin, substantially as above described and herein set forth.

50,145.—Wagon Brake.—A. B. Mattoon, Niles, N. Y.:

I claim the pulley fulcrumed levers, E P N E P N, the revolving brake block, B, the short single lever, S, and the rod, T, combined and arranged as described.

50,146.—Apparatus for Enameling Moldings.—Benjamin McEachren, San Francisco, Cal.:

I claim as my invention and improvement in enameling baths a movable bottom for raising the work or moldings up out of the enamel or paste, substantially as described; and, in combination with the enameling bath, I claim the steam chamber for heating the bath, and keeping it hot, substantially as described.

I also claim the combination of the transversing carriage, hopper and enameling tool, substantially as described, for the purpose set forth.

50,147.—Ventilating Pad.—James P. McLean, Brooklyn, N. Y.:

I claim the spring plate, A, having an opening or openings, N N N N, either separate or in combination with the volute or cone-shaped spiral spring or springs, S S S S, operating in the manner and for the purpose set forth.

Second, I claim the volute or cone-shaped spiral spring or springs, S S S S, either separate or in combination with the spring-supporting surface, A A A, with openings, N N N N, as applied to a riding saddle or harness tree for ventilative and other purposes, substantially in the manner and for the purposes set forth and shown in the drawings.

50,148.—Car Coupling.—Amos Melot and Jeremiah T. Try, Reading, Pa.:

We claim the arrangement of the troughs, T, spiral springs, F, chain, G, and lever, L, when constructed and combined with the frame and rubber lining, as herein described, and for the purposes set forth.

50,149.—Curtain Fixture.—Purches Miles, New York City:

First, I claim a friction knob, button or analogous device, in combination with the cord passing from the spool of the curtain roller, and a spring or its equivalent, to take up the slack of said cord, substantially as and for the purposes set forth.

Second, I claim the inclined slots or notches, formed in the bracket, d, for the reception of the axis of the curtain roller, so that the bracket can be used at either end of the roller, in the manner and for the purpose set forth.

50,150.—Hay Derrick.—William Minick, Kansas, Ill.:

First, I claim the swivel upright, E, applied to the permanent upright, B, in combination with the inclined box, F, secured to E, and connected to the lower part of B by the bar, H, all arranged substantially as shown, to form a new and improved crane for a hay elevating device.

Second, The segment, I, attached to the bar, H, in combination with the rope, J, pulley, K, and the hoisting and branch ropes, L L', all arranged in combination with the crane, to operate in the manner substantially as and for the purpose set forth.

Third, The bracing of the inclined bar, F, by means of the transverse bar, G, and iron rods, d d, substantially as and for the purpose described.

[This invention relates to a new and improved machine for elevating hay, and it consists in a novel construction and arrangement of the parts, whereby a very simple and efficient device is obtained for the purpose, and one which may be operated with but little labor.]

50,151.—Pressure and Gravitation Machine.—Charles Monson, New Haven, Conn. Antedated Sept. 15, 1865:

First, I claim the double utilization of vapor and weight of the same fluid, for the purpose and substantially in the manner as herein set forth.

Second, The use of two fluids, a denser and a lighter, substantially in the manner and for the purpose described, but as having the slot, d, in the said lever, to enable the latter to slide upward on its fulcrum, under circumstances and for the objects as hereinbefore explained.

50,152.—Car Coupling.—Loring Moody, Malden, Mass.:

I claim as my improvement in the car coupling, as made not only with the pendulous pin, C, combined with or applied to the lever, B, and so as to operate therewith, in manner and under pressure of the link, substantially as described.

50,153.—Apparatus for Ejecting Refuse Moth from Steam Vessels.—John Palmer, Sandifield, Mass. Patented in England July 23, 1863:

I claim the construction and arrangement of apparatus, substantially as herein specified, for expelling solid and liquid substances from ships and other vessels into the water below the water line, and for other analogous purposes, as herein set forth.

50,154.—Water Pipe.—John S. Patric, Victor, N. Y. Antedated Sept. 18, 1865:

I claim a pipe composed of wooden hoops spirally wound, substantially as shown and for the purposes herein set forth.

50,155.—Hydrant.—R. P. Patterson, Cincinnati, Ohio:

I claim the arrangement of main pipe, A, valve chamber, B, slotted aperture, E, axial plunger, D, branch, C, discharge pipe, F, and drip or waste way, H, the same being combined and operated substantially as set forth.

50,156.—Let-off for Looms.—Job Phillips, Pawtucket, R. I.:

I claim combining the vibrating bar, J, with the shield, H, by means of the arm I, rigidly attached to the bar, all constructed and arranged as described.

50,157.—Sewing Machine.—Louis Planer, New York City:

I claim the employment and use of a braider, in combination with a lifting presser foot, whereby the sewing of braid, cord, etc., for ornamental work, in curves, figures, etc., is greatly facilitated, substantially as described and specified.

50,158.—Cider Mill.—Charles Pool and Moses Eddy, Blissfield, Mich.:

I claim the perforated cylinder, G, encompassed by the screen, b, in connection with the endless conveying band, E, the pressure band, H, and any suitable grating or crushing device, substantially as and for the purpose herein set forth.

50,159.—Harvester Rake.—John Paulson, Jr., Pittstown, N. J.:

I claim the shaft, N, operated through the medium of the crank pulley, K, and connecting rod, L, in connection with the cam, O, lever, P, chain, Q, and pivoted socket, R, in which the rake staff, K', is fitted, all being arranged to operate substantially in the manner as and for the purpose specified.

[This invention relates to a new and improved automatic raking device for harvesters, whereby, it is believed, a simple, economical and efficient means is obtained for the purpose specified, and one which will operate perfectly when the machine is passing over undulating or uneven ground.]

50,160.—Flour Sifter.—E. L. Pratt, Boston, Mass.:

I claim, First, The combination of the clamp, a, and standard, B B', made to operate substantially as described.

Second, I claim the rocker bar, D, when pivoted to the crank shaft, C, for the purpose set forth and described.

Third, I claim the vibrating fingers, E E, when constructed to operate in the manner and for the purpose set forth.

50,161.—Steam Boiler.—T. W. Pratt, Boston, Mass.:

First, I claim the cone-shaped boiler, constructed as set forth, provided with the inclined radial flues, substantially as and for the purpose described.

Second, The conical chimney or case, in combination with the cone shaped boiler, substantially as set forth and for the purpose described.

50,162.—Washing Machine.—T. J. Price, Macomb, Ill.:

I claim the springs, f, attached to the vibrating frame, in combination with the movable plunger, C, and the stationary board, B, all arranged and operating as and for the purpose set forth.

50,163.—Manufacture of Boots and Shoes.—Dan Read, New York City:

I claim securing soles made or formed of gutta-percha, india-rubber, or other vulcanizable gums, compounded and prepared for vulcanization to boots or shoes made of leather, and vulcanizing the same, in the manner and for the purposes specified.

I also claim covering the uppers of boots and shoes made of leather with the compound above referred to, and vulcanizing it on the leather, in the manner and for the purpose specified.

50,164.—Ruffling Device for Sewing Machine.—Leonard C. Riggs, Florence, Mass.:

I claim, First, A ruffler and gathering device for use on sewing machines, which is distinct from, and independent of, the feeding device, and which does not feed the material, but which is operated

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by the movement of the material in sewing, constructed and operating substantially as shown and described.

Second, I also claim, in combination with the geared wheels. C H and O, with the spring plates, a and d, for the purpose of ruffling and gathering cloth when being sewed, substantially as described.

50,165.—Apparatus for Finishing Hats.—John A. Roche and J. J. Stewart, Williamsburgh, N. Y.:

We claim, First, In hat-finishing machines, the combination on the same arm of an iron and a lurer, substantially as described.

Second, We also claim hanging the iron from a hollow shaft, H, substantially as described, so that the whole series of irons can be raised and lowered, by means of the crank shaft, B.

Third, We also claim applying a yielding pressure on the hub, F, so that the irons are free to move upward when passing over an uneven surface, substantially as shown.

Fourth, We also claim arranging and operating a series of hat blocks and a series of irons around a common center, substantially as shown.

Fifth, We also claim the combination, substantially as shown, of the spindles, T, one or more, with the hat blocks, L, one or more, and the pawl and ratchet, the same being constructed and operated substantially as shown

Sixth, We also claim placing a pulley in the base of a hat block, for tightening the cord which fastens the hat on the block, substantially as shown.

Seventh, We also claim in hat blocks passing a cord through its side or sides, for the purpose of holding the hat thereon during the ironing process, substantially as described.

50,166.—Chair Bottom.—Charles Russell, Wilmington, Ohio:

I claim the additional set of rounds or slats, B B, situated closely below, and in combination with, the ordinary upper set of rounds, A A, substantially as and for the purpose herein specified.

50,167.—Snap Link.—C. W. Saladee, Newark, Ohio:

I claim the spring, B, or its equivalent, in combination with the open link, A, in the manner and for the purpose substantially as shown and described.

50,168.—Bed Bottom.—R. S. Sanborn, Ripon, Wis.:

I claim the combination of longitudinal and transverse wooden slats, D and G, suspended from the frame by annular rubber springs, which are attached to notched strips, E and H, substantially in the manner described.

50,169.—Alarm Coffee Boiler.—E. K. Sargeant, Boonton, N. J. Antedated Sept. 14, 1865:

I claim as my invention, and desire to secure by letters patent, the combination and arrangement in a coffee boiler of the condenser, C, with the tube, T, valve, v, and whistle, w, substantially in the manner and for the purpose herein set forth.

50,170.—Machinery for Dressing Edges of Slate Frames.—John W. Sayre and Alexander S. Schull, Martin Creek, Pa.:

I claim the frame, T, arranged to vibrate as described, and provided with a clamp, V, or its equivalent, and operated in connection with the rotating cutter, J, for the purpose of rounding the corners of slate frames.

50,171.—Fire Shrinking Machine.—Melchi Scott, Fairfield, Iowa.

First, I claim the caps, C C, dogs, 2 2, and the cranks, 1 1, constructed and arranged as described.

Second, The rods, p p, evener, O, and clevis, R, in combination with the lever, P, for operating the clamping device, as described.

50,172.—Fruit Jar.—Allen Sherwood, Auburn, N. Y.:

I claim removing preserved fruit from a can, jar, bottle, or other article in which it may have been placed, by means of a secondary receiver or vessel, properly secured thereon, and from which the air is exhausted, substantially in the manner described and for the purpose specified.

50,173.—Dividers.—S. Addison Shurtleff, Taunton, Mass.:

I claim the centering leg, D, arranged in combination with the main legs, B, B', substantially as and for the purpose described.

Also passing the centering leg through the head of the dividers, substantially as and for the purpose specified.

[This invention consists in combining with the ordinary legs of a pair of dividers a centering leg, which passes down through the head of the dividers, and is adjustable in a nut suspended by suitable links or toggle arms from the ordinary legs, in such a manner that said centering leg can be adjusted up and down, according to the position of the main legs, and that by the centering leg the distance measured off by the main legs can be divided off in two equal parts without loss of time.]

50,174.—Steam Generator.—George Sill, Wilkins, Pa.:

I claim the application of an additional boiler or water space, in combination with the smoke chamber and with the hermetically closed fire-place of a steam generator, constructed and operating substantially as and for the purpose set forth.

[The object of this invention is to employ the heat which gradually escapes from a steam boiler uselessly into the smoke stack, for the purpose of raising the temperature of a mass of water, and eventually to generate steam.]

50,175.—Clamping Device.—Edward Simmons, South Providence, R. I.:

I claim the employment or use of wooden, gutta percha, leather or strips of other material, inserted in, or applied to, a clamp of a boot-crimping machine, substantially in the manner as and for the purpose herein set forth.

50,176.—Vent for Barrels.—Thomas Simmons, Chicago, Ill.:

I claim, First, The combination and arrangement of the cylinder, A, the piston, C, cushion, c, spring, H, and their slots, a, substantially as specified and shown

Second, I claim, in combination with the above-mentioned parts, the employment of the tapering hollow screw, N, as and for the purposes set forth.

50,177.—Method of Preparing Mastic Roofing.—Robert Skinner, George Duncan and Cesare Merighi, San Francisco, Cal. Antedated Sept. 22, 1865.:

We claim the described combination of coal tar in combination with brimstone, mixed together in the manner and about in the proportion described, and applied to the canvas and roof, substantially as and for the purpose set forth.

50,178.—Planing Machine.—H. B. Smith, Lowell, Mass.:

I claim the use of the horizontal universal jointed shaft, r, in connection with the feed rollers of planing machines, etc., arranged substantially in the manner described and for the purpose specified.

[This invention consists in connecting and arranging the upper and lower feed rollers of the planing machines in such a manner that they can be properly adjusted with regard to each other at pleasure, thus increasing or decreasing the opening or space between them, according to the thickness of the board or plank to be planed, without disconnecting or disarranging their connection with the driving power employed.]

50,179.—Bee Hive.—George Spinney, Saugus, Mass.:

I claim, First, Arranging the two boxes of a double-box bee hive, in such a manner that a dead air space shall be left between the two and surrounding the inner box at all its sides and bottom, substantially as and for the purposes described.

Second, In combination with the swinging frame, C, the board, P, to be applied for winter use, or in transporting the hive, substantially as herein described, I claim the ventilating cover, H, when constructed with air passages, R and S, and double inner and outer protecting screens, as herein described.

50,180.—Soap Composition.—E. Sprague, Schenectady, N. Y.:

I claim a soap composed of the within-described ingredients, mixed together substantially in the manner and about in the proportion set forth.

50,181.—Fruit Jar.—John J. Squire, New London, Conn.:

I claim closing the ent hole, D, and supply hole, E, of the cover of a jar by means cap F, made substantially as described.

I also claim holding the covers of jars in place by means of elastic bands or straps, or their equivalents, applied substantially as shown and described.

[This invention consists in an improvement in fruit jars, whereby, among other new features, the cover is held down upon the body of the jar with an elastic pressure by means of a strap of rubber or other yielding material or device.]

50,182.—Meridian Finders.—William Stackpole, Brooklyn, N. Y.:

I claim a meridian finder, in combination with a transit or similar surveying instrument, said finder consisting of a reflector mounted on an axis at right angles to the line of collumination of the telescope, and having a movement around a center concentric with said line of collumination, substantially as described.

50,183.—Oil Ejecting Cup.—Henry E. Stager, Milwaukee, Wis.:

I claim the adjustable valve, E, in combination with the thread on the rod, D, and the conical spout, C, to regulate the aperture.

50,184.—Cement.—John Stansfield, Brooklyn, N. Y.:

I claim the cement composition herein described.

[This invention relates to the production of a cement to be used for the splicing of machine belts and other similar purposes where the article is subjected to any severe strain.]

50,185.—Die for Making Buttons.—Albert C. Sweetland, North Attleboro, Mass.:

I claim the combination of a counter punch, b, and the discharging passage, c, thereof, with the dies, A B, and each of the main punches, a, thereof, the whole being arranged substantially as and to operate as specified.

I also claim the arrangement of the groove frame, V e, with the upper of the two dies, A B, and their punches, a a, the whole being as explained.

50,186.—Artificial Denture.—S. C. Taylor, Monroe, Mich.:

I claim the rim, a, projecting from the inside or back part of the teeth, as shown.

Second, The holes, b and f, in the rim, a, and the outer edge of the gum, B, substantially as and for the purpose set forth.

Third, The combination of the vertical pins, e, and dovetailed cavities, c, in the rim, a, as and for the purposes set forth.

50,187.—Casting Grooved Rolls in Metal Molds.—Robert C. Totten, Pittsburgh, Pa.:

I claim casting chilled rolls with grooves, by means of a metallic mold or chill furnished with suitable projections in its inner surface, substantially in the manner hereinbefore described.

The combination with a chill or metallic mold for casting rolls of the rings, a b and c, divided into two or more parts, and attached to the inner surface of the chill by means of screws or other equivalent device, for the purpose of casting grooved chilled rolls, substantially in the manner hereinbefore described.

50,188.—Machine for Making Knitting Needle.—C. P. S. Wardwell, Lake Village, N. H.:

First, I claim the arrangement and combination of the horizontally reciprocating table, M, the vertically-reciprocating frame, N, and the revolving mill or mills, T, respectively performing the several functions, and in relation to one another, substantially as and for the purposes herein specified.

Second, I also claim the auxiliary cam wheel or projection, E, or the main cam, G, in combination with the additional lever, k, pivoted to the cam lever, g, and to the connecting rod, J, so as to produce increased leverage, substantially as and for the purpose set forth.

Third, I also claim the perforated shear projections, 88, on the movable jaws or dies, P P, by which the wires are guided and held in place, as well as cut off, in connection with the stationary dies, o o, as herein specified.

Fourth, I also claim the notched springs, K K, in combination with the shear projections of the movable dies or jaws, P P, for clamping the wires and drawing them forward with the table, M, substantially as herein set forth.

Fifth, I also claim spotting the needles, and holding them in the same position and by the same means as when spotted, till all the operations upon them are completed, substantially as herein specified.

Sixth, I also claim the mechanism, or the equivalent thereof, substantially as described, whereby the needles are spotted and then continually held, in like manner and by the same means, till all the operations of the machine upon the needles are completed.

Seventh, I claim so spotting the needles as to leave the rear ends thereof round or of the full size, when arranged in combination with the wire behind, so that the latter shall strike the needles and expel them from the machine, substantially as herein set forth.

Eighth, I also claim expelling the milled needles from, and feeding the forward wires upon, the table, M, by the return motion of said table, the wires remaining stationary for the purpose.

Ninth, I also claim the levers, p p, for operating the movable jaws or dies, P P, arranged and operating substantially as described.

Tenth, I also claim the wedges, Q Q, on the frame, N, traveling with the table, M, in combination with the levers, p p, as set forth.

Eleventh, I also claim the bed pieces, V V, arranged substantially as and for the purposes herein specified.

Twelfth, I also claim gaging the milling of the boards through patterns, XX, actuated by the movements of the table, M, so as to raise or lower the mill or cutter shaft, as required, substantially as specified.

50,189.—Thill Coupling.—H. K. Waterhouse, Factory Point, Vt.:

I claim the spring catch, composed of a spring, C, provided with a beveled projection, b, and applied to the coupling pin, B, in connection with the recess, e, in the ear, A, substantially as and for the purpose herein set forth.

50,190.—Coupling for Shafts of Boring Tools.—James Watson, Philadelphia, Pa.:

First, I claim the construction of a coupling joint by means of collars, f f, formed in the solid metal near to the end of the pieces of cylindrical bodies to be jointed, the shell, C C, in two or more parts, with its external conical form, and the sleeve, D, with its external conical form, coupling the above parts, as described.

Second, The thread, g, with the nut, E, in combination with the sleeve, D, in this manner, for the purpose described.

Third, The formation of a taper thread on the shell, C C, and within the sleeve, D, in the manner and for the purpose described.

50,191.—Harvesting Machine.—John Werner, Jr., Prairie du Lac, Wis.:

First, I claim the shaft, M, provided at one end with an arm, R, attached to the axle of a grain wheel, S, and provided at its opposite end with an arm, N, connected by a rod, O, with a lever, P, on the main frame, A, which lever is connected by a rod, i, with an arm, A, at the rear of the draft pole, B, substantially as and for the purpose set forth.

Second, The securing of the wheel, D, to its shaft, C, by means of the screw, d, and jam nuts, e e, substantially as and for the purpose specified.

[This invention relates to a new and improved raking attachment for automatically clearing or raking the cut grain from the platform. It also relates to a new and improved means for adjusting the sickle to any desired weight; and, further, to a means employed for admitting of the speed of the sickle being varied as may be required.]

50,192.—Lantern.—Wm. Westlake, Chicago, Ill.:

First, I claim the band, d, in combination with the band, b, for the purposes set forth.

Second, The band, l, in combination with the band or upright portion of the bottom, e, for keeping the bottom of the globe in place, as herein described.

Third, The means described for securing the lower ends of the upright bars to the lower bar of the guard.

50,193.—Curtain Clasp.—Jos. G. Whittier and Thos. M. Powell, Attica, Ind.:

We claim a device for holding up window curtains, constructed substantially as shown and described

[The object of this invention is to provide a device for holding up window curtains, by using which all kinds of rollers and the various means of operating them, may be dispensed with, and the invention consists in the construction of a neat and ornamental device for clasping the curtain and confining the roll after the curtain has been rolled up to the desired hight.]

50,194.—Packing Tubes of Oil Wells.—R. A. Wilder Cressona, Pa.:

I claim, in combination with the flexible bag, B, the pipes, C and E, with the valves, i and g, and wire rods, j and h, for the purposes specified.

50,195.—Buckle Fastening.—Wm. Wiley, Jr., Kokoma, Ind.:

I claim a buckle, which is constructed of two parts, B and C, the part, B, having elevations, a, on it, on the part, C, being provided with pivoted loop, b, and lugs, d d, for retaining the part, B, in place, substantially as described.

50,196.—Skate Sharpener.—F. R. Willis, Waltham, Mass.:

I claim a file for sharpening skate irons, having either adjustable or fixed guides, substantially as herein described and for the purpose specified.

I also claim the combination of the file and burnisher, as herein described.

50,197.—Apple Cutter and Corer.—John Wroten, Salisbury, Md.:

I claim the combination of the rector cutter, E, the tubular shank, C, moving in a vertical sleeve, and lever, D, operating within the frame, A, as and for the purpose described.

[The object of this invention is to provide a cheap and efficient device for cutting and coring apples preparatory to drying the same, for producing the article known in the market as dried apples. This invention consists in the use of a circular cutter, divided into sections, which, when forced through the apples placed underneath, will divide or cut the same in pieces of a suitable size for drying. The said cutter has a hollow shaft, and its lower end sharpened which, when pressed down, will take out the core of the apple at the same time that the apple is sliced or divided by the cutter, and discharge the core out of its top end.]

50,198.—Ice Crusher.—Wm. W. Armington (assignor to Geo. E. Mitchell), Lowell, Mass.:

I claim the combination of the crusher, B, the pivoted box, A, the shaft, D, lever, E, and spring, H, operating substantially as and for the purpose specified.

50,199.—Fruit Masher or Lemon Squeezer.—Wm. W. Armington (assignor to Geo. E. Mitchell), Lowell, Mass.:

I claim the platform, A, the stand, B, with its arms, D and E, the lever, C, the horn, I, the yoke, X, the roller, c, the spindle, K, the mash, L, the spring, R, brace, H, the whole arranged to operate substantially as herein set forth and shown, for the purpose specified.

50,200.—Device for Swaging Chain Links.—Virgil Draper (assignor to Oscar M. Draper), North Attleboro, Mass.:

I claim the combination or mechanism, substantially as described, for the purpose set forth, the same consisting of the bed disk, the compressers, the punch and the ring holder and former, the whole being arranged as specified.

50,201.—Seeding Machine.—B. F. Field (assignor to himself and E. T. Bond), Sheboygan Falls, Wis.:

First, I claim adjusting the runners, t, so as to press upon the heel or point, as desired, substantially in the manner as described.

Second, I claim the stirrup L, for the purpose of attaching and adjusting the covering roller, K, substantially as set forth.

Third, In combination with the seed roller, B, the shoe, C, for the purpose of preventing an overflow of seed, substantially as set forth.

Fourth, In combination with the seed roller, the spring, D, for the purpose of preventing an overflow of seed, substantially as set forth.

Fifth, The oblique seed cells, U U, substantially as and for the purpose set forth

50,202.—Combined Potato Planter, Seeder and Cultivator.—B. F. Field (assignor to himself and E. T. Bond), Sheboygan Falls, Wis.:

First, I claim the combination and arrangement of the feed wheel, I, shoot, K, and cultivator teeth, E E E, substantially as shown and described, and for the purpose set forth.

Second, The combination and arrangement in a seeding machine of the pulleys, B and P, and the set screw, k, for the purpose of regulating the tension of the belt, substantially as set forth.

Third, I claim the compound dray bar, formed of the two parts, d d, Fig. 5, connected by the slotted plate, M, substantially as and for the purpose set forth.

Fourth, I claim the stop, H, arranged and operated as described, and for the purpose set forth.

50,203.—Manufacture of Sheet Iron.—John and Thomas Grey (assignor to themselves and John D. and Wm. Grey), Pittsburgh, Pa.:

We claim the mode of finishing sheet iron by the process hereinbefore described, consisting of passing it repeatedly through the finishing rolls without removing the scale or oxide when the iron has been previously heated to the ordinary high heat for rolling, and allowed to cool after each heat below the point of a cherry red before passing it through the finishing rolls, for the purpose hereinbefore described.

50,204.—Machine for Making Paper Cap Tubes for Spinning Machines.—Wm. J. Gums (assignor to A. Burgess & Co.), Providence, R. I.:

First, I claim the combination of the rotating and sliding mandrel with the pressure roller, substantially as described, for rolling up and discharging the tubes, as set forth.

Second, The combination of the rotating and sliding mandrel and pressure roller, with the reciprocating motion of the brush, or equivalent therefor, substantially as described, for discharging the paper tubes when completed.

Third, The combination of the rotating mandrel and pressure roller, to roll up the paper with the rotating brush, substantially as described, whereby the end of the paper when introduced is caused to lap around on the mandrel, as set forth.

Fourth, The reciprocating nippers, in combination with the rotating mandrel, substantially as described, and for the purpose of properly presenting the paper to the mandrel, as set forth.

Fifth, The combination of the shears, or the equivalent thereof, substantially as described, to cut off the length of paper required for each tube, with the feeding mechanism for moving the sheet of paper, and the mandrel for winding up the paper, as set forth.

Sixth, The combination of the rollers for feeding the paper and applying paste thereto, the vibrating roller for distributing the paste on the face of the paper, and the mandrel for forming the paper tubes, substantially as described.

Seventh, The combination of the rollers for feeding and applying paste to the paper, the roller for distributing the paste, the shears for cutting off the length of paper required for each roll, the reciprocating pincers, and the mandrel for winding up the paper, or the equivalents of all or any of them, as described.

50,205.—Injector for Steam Boilers.—Sidney Maltby and Charles Osborn, Dayton, Ohio, assignors to themselves and William H. Clark, Cincinnati, Ohio:

First, We claim the valve, E, the nozzle, G, the packing ring F, the nozzle, H, the cap, D, and cylinder, S, constructed and arranged substantially as described and for the purposes set forth.

Second, We claim the arrangement of the nozzle, L, the waste cock, 3, the flange, V, the lock nut, W, and the cylinder, S, substantially as described.

Third, We claim the supplementary valve, x, attached to a check valve, substantially as described, and for the purposes set forth.

Fourth, We claim the arrangement of the hollow vessel, K, the check valve, 5, or its equivalent, and the vent cock, 4, for the purposes specified.

Fifth, We claim the arrangement of the hollow vessel, B, the pipe, A, and stop cocks, 1 and 2, for the purposes specified.

Sixth, We claim the adjusting index, in combination with the steam injector, for the purposes set forth.

Seventh, We claim the float, I2, in combination with the valves of the injector, for the purposes specified.

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Eighth, We claim the arrangement of the water jackets, T and U, substantially as described, and for the purposes set forth.

Ninth, We claim a water jacket, when applied to a steam injector, substantialiv as and for the purpose described.

50,206.—Harvesting Machine.—Griffith Murphy (assignor to himself and Wm. D. Slack), Lewisburg, Pa.:

I claim, in combination with the axle of the machine, the main frame, composed of the two sections, and united or connected therewith, substantially as and for the purpose described.

And I also claim, in combination with the axle and the two sectional frames connected therewith, as herein represented, the arrangement of the driving gear, as herein described and set forth.

50,207.—Washing Machine.—C. C. Phelps (assignor to George G. Campbell), Janesville, Wis.:

I claim the combination of the oscillating presser or rubber, C C, when constructed with vertical curved bars, P, and horizontal ones, l, and the corrugated piece E', with the corrugated bottom piece. E, and parallel side bars, F, the whole constructed and operating substantially as described, and for the purpose set forth.

50,208.—Steam Pressure Gage.—Christian C. Schmidt (assignor to himself and Brothers), New York City:

I claim the continuous endless oblong spring, for the purposes hereinbefore set forth.

I also claim the construction of the spring, thicker at its shank or point of connection with the hollow joint than throughout its length, whereby to give more support to the spring, for the purposes hereinbefore set forth.

I also claim the hollow endless spring, hereinbefore described, in combination with the quadrant-shaped racks and indicator, for the purpose of registering the pressure of steam in steam generators, substantially as hereinbefore set forth.

59,209.—Carriage Spring.—Alexander Selkirk (assignor to Eliza J. Selkirk), Albany, N. Y.:

I claim the levers, D and E, formed as described, and fitted with india-rubber springs, S and t, in combination with the elliptic springs, C1 and C2, substantially as set forth in the above specification.

50,210.—Horse Hay Fork.—S. H. Wheeler, Dowagiac, Mich., assignor to himself, Abner G. Townsend, James Stillwell, R. Heddon, Evan P. Townsend, Chauncey T. Lee and James Sullivan:

I claim, First, The combination of two forks, A A', provided with the suspension bales, B B', and pivot connection, C, and a tripping and retaining device, d e g, substantially as described.

Second, Suspending the forks, A A', which have handles, c c', at a point above the upper extremities of said handles by means of bails which are pivoted to the two forks, and which connect these forks together, substantially as described.

Third, The yoke, f, and yoke, e, in combination with the latch, d, applied to the handle, c', of the fork, A', and adapted to receive and hold the handle of fork, A, substantially in the manner and for the purposes described.

50,211.—Carding Engine.—Evan Leigh, Manchester, Eng.:

I claim, First, The peculiar construction, shown and described, of an endless chain or flats or top cards, being self-stripping, and to which any definite angle of the periphery of the main carding cylinder, when at work, can be given.

Second, The pushed chain, by which the flats are hung or suspended in such a way that the pressure of their own weight is received by the chain bushes and the flats are allowed to swivel freely and adjust themselves to any angle to the surface of the main cording cylinder they may have been cut for.

Third, The general arrangement and combination of all the parts as herein described, and illustrated in the accompanying sheet of drawings.

50,212.—Apparatus for Freezing Liquids.—Jean Baptiste, Java Mignon and Stanislas Henri Rouart, Paris, France:

We claim, First, The general construction and arrangement or combination of apparatus having continuous action.

Second, The general construction and arrangement or combination of apparatus having intermittent action.

Third, The particular construction and arrangement of the pumps, stop cocks, distributor and safety valve, all as herein shown and described.

50,213.—Seed Planter.—John Miller, Russelville, Ky.:

I claim, First, Surrounding the openings in the grain trough with bristles, arranged and operating substantially in the manner set forth.

Second, The combination of the feed roller with the feed tubes and bristled opening, for the purpose of sowing broadcast or in drills, substantially as described.

Third, The combination of the harrow, plows, seed tubes, covering bars and smoothing roller with the feed roller and bristled seed trough, arranged and operating subetantially in the manner and for the purpose described.

REISSUES.

2,074.—Fire-place.—Calvin A. Littlefield and David Boyle, Covington, Ky., assignees of Calvin A. Littlefield. Patented Sept. 11, 1860:

We claim, First, The provision or attachment to an open fire-place or grate of the bonnet, D, constructed and applied to catch the smoke and form a ledge or shelf over the fire, substantially as set forth.

Second, The arrangement of the bonnet, D, hollow crown, E, partition, e, tube, H, flues, B B', apertures, K F G, and doors, f and k, constructed, combined and operating in the manner and for the purposes set forth.

2,075.—Tea and Coffee Pot.—Edward B. Manning, Cornwell, Conn. Patented June 3, 1862. Reissued June 27, 1865:

I claim the herein-described tea or coffee pot, in which the bottom and lower portion of the body is constructed of hard metal, as iron, united to a britannia or other metal body in the manner described, when the said hard metal bottom and body are formed in the manner described, and united to the upper portion of the body a sufficient distance from the bottom to protect the joint and upper portion of the body from the effects of heat, as and for the purpose specified.

2,076.—Cook Stove and Range.—Josiah M. Reed, Boston, Mass. Patented Nov. 8, 1859:

I claim the application to a cooking stove, range, etc., of an auxiliary heating space or flue, substantially in manner and to operate as hereinbefore described.

2,077.—Head or Screw for Picture Frames.—Joseph B. Sargent, New Britain, Conn. Patented Aug. 21, 1860:

I claim a picture nail or screw, provided with an ornamental head made in parts, connected together substantially as described.

2,078.—Grate for Furnaces. Andrew Winterburn, Albany, N. Y. Patented Nov. 3, 1863:

I claim a grate, having in its bed a revolving axis, with its appurtenances so contrived that, by its revolution, the contents of the grate shall be agitated, in combination with an extended bed, so contrived and arranged that it can make a partial or entire revolution around its own axis, by which means the contents of the grate can be discharged into the ash pit, substantially as and for the purpose described.

also claim the axis, E, and disks, H, in combination with the revolving frame, B, constructed and operating substantially as and for the purpose described.

Back Numbers and Volumes of the "Scientific American."

VOLUMES IV., VII., XI. AND XII., (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $3 00 per volume, by mail, $3 75 which includes postage. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding VOLS. I., II., III., V., VI., VIII., IX. and X., are out of print and annot be supplied.

PATENTS

GRANTED

FOR SEVENTEEN YEARS.

MUNN & COMPANY,

In connection with the publication of the SCIENTIFIC AMERICAN, have acted as Solicitors and Attorneys for procuring "Letters Patent" for *new inventions* in the United States and in all foreign countries during the past *seventeen years*. Statistics show that nearly ONE-HALF of all the applications made for patents in the United States are solicited through this office; while nearly THREE-FOURTHS of all the patents taken in foreign countries are procured through the same source. It is almost needless to add that, after *eighteen years'* experience in preparing specifications and drawings for the United States Patent Office, the proprietors of the SCIENTIFIC AMERICAN are perfectly conversant with the preparation of applications in the best manner, and the transaction of all business before the Patent Office; but they take pleasure in presenting the annexed testimonials from ex-Commissioners of Patents.

MESSRS. MUNN & CO.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours very truly,

CHAS. MASON

[See Judge Holt's letter on another page.]

Hon. Wm. D. Bishop, late Member of Congress from Connecticut, succeeded Mr. Holt as Commissioner of Patents. Upon resigning the office he wrote to us as follows:

MESSRS. MUNN & CO.:—It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency; and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy Very respectfully, your obedient servant,

WM. D BISHOP.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent, free of charge. Address MUNN & CO., No. 37 Park Row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service which Messrs. MUNN & CO. render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there; but is an opinion based upon what knowledge they may acquire of a similar invention from the records in their Home Office. But for a fee of $5 accompanied with a model, or drawing and description, they have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, etc., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through the Branch Office of Messrs. MUNN & CO. corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office, and it is a very wise course for every inventor to pursue. Address MUNN & CO., No 37 Park Row, New York.

The Patent Laws, enacted by Congress on the 2d of March, 1861, are now in full force and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish, and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention the Government fee for a caveat is $10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

INVITATION TO INVENTORS.

Inventors who come to New York should not fail to pay a visit to the extensive offices of MUNN & CO. They will find a large collection of models (several hundred) of various inventions, which will afford them much interest. The whole establishment is one of great interest to inventors, and is undoubtedly the most spacious and best arranged in the world.

UNCLAIMED MODELS.

Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

FOREIGN PATENTS.

Messrs. MUNN & CO., are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business they have offices at Nos. 66 Chancery lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. They think they can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through their agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Pamphlets of information concerning the proper course to be pursued in obtaining patents in foreign countries through MUNN & CO.'S Agency, the requirements of different Government Patent Offices, &c. may be had, gratis, upon application at the principal office, No. 37 Park Row, New York, or any of the branch offices.

SEARCHES OF THE RECORDS.

Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

ASSIGNMENTS OF PATENTS.

The assignment of patents, and agreements between patentees and manufacturers carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft or Postal Order on New York, payable to the order of Messrs. MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

REJECTED APPLICATIONS.

Messrs. MUNN & CO. are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of their Washington Agency to the Patent Office affords them rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Their success in the prosecution of rejected cases has been very great. The principal portion of their charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with MUNN & CO., on the subject giving a brief history of the case, inclosing the official letters, etc.

MUNN & CO. wish it to be distinctly understood that they do not speculate or traffic in patents, under any circumstances; but that they devote their whole time and energies to the interests of their clients.

Patents are now granted for SEVENTEEN years, and the Government fee required on filing an application for a patent is $15. Other changes in the fees are also made as follows:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
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EXTENSION OF PATENTS.

Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort of extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention.

Patents may be extended and preliminary advice obtained, by consulting, or writing to, MUNN & CO., No. 37 Park Row, New York.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York

Notes and Queries

W. C., of Mich.—The most suitable vessels for storing vinegar are wooden casks. If vinegar were put into a cistern covered with carbonate of lime, it would be decomposed, the lime combining with the vinegar to form acetate of lime, which would be dissolved—thus destroying the cistern and spoiling the vinegar. Plaster of paris—the sulphate of lime—would not be decomposed by vinegar, but it would need to be very pure indeed not to injure the vinegar.

J. Y. K., of Pa.—The experimental overshot wheel tried by a committee of the Franklin Institute some years ago, in Philadelphia, yielded about 70 per cent of the whole power of the water. At the more recent trial, at the Fairmount Water Works, the turbine of J. W. Stevenson, of No. 200 Broadway, New York, yielded about 88 per cent, beside the friction, which was estimated at 3 per cent. This was the best result obtained.

A. J. H., of Mass.—If people generally knew what a frightful train of painful and dangerous diseases result from poisoning by lead, they would be far more careful than they are to exclude that metal from their stomachs. If the paint has been taken from your tub by the salt-water bath for your cucumbers, we advise you to throw the pickles away.

A. F. and R. N. G., of Ill.—We believe that attempts have been made to drive machinery by spiral and other wheels connected with boats anchored in running streams, but the wheels turned so slowly that very little power was obtained. We have no data for computing the power to be got in this way.

F. S., of Ill.—The expansion of iron has been used as a means of employing the mechanical force of heat, but the scope of its expansion is so small that, practically, it cannot compete with steam or air for most purposes.

H. W. R., of Mass.—If iron in the process of zincing is heated too hot the zinc is very apt to penetrate the iron, forming an amalgam, and making the metal brittle.

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H. D., of N. Y.—We have already published the statement that starch, sugar has been used in Europe to adulterate cane sugar.

C. P., of Cal., asks the following:—A invents something; B has money; A has none; B pays all the expenses for getting the invention patented. In making out the papers, B signs them the same as A, takes the oath as inventor, the same as A, but has had nothing in the least to do with the inventing. The patent issues to B and A. In your opinion the patent should, of course, have been assigned to B, but, as the case now stands, are there any evil consequences to follow for B? Can anything be done to him; if so, what? Ans.—If it could be shown that B purposely made oath that he was joint inventor, well knowing that it was a falsehood, then he is liable to the penalties for perjury. A joint patent issued to two persons as inventors, when, in fact, only one of them was inventor, is invalid and worthless.

J. H. D., of Mass.—It is susceptible of mathematical demonstration that a balloon could not be propelled by an engine which it would support in the air, more than five miles per hour. The idea of a copper balloon is preposterous; it would be too heavy.

A. P. W., of Wis.—When the carbon is all burned out of cast iron in the Bessemer process, and the metal is brought to the state of pure wrought iron in a molten condition, melted cast iron may be added to it, in order to introduce the desired quantity of carbon. It is not probable that you could get the requisite heat to fuse pure wrought iron in a cupola furnace.

P. W., of Ill.—The fire surface of a boiler is the fire-box, tube sheet and tubes in a locomotive boiler. In a cylinder boiler the bottom; in fact any part on which the heat acts directly.

C. F. S., of N. J.—There have been several improvements in the manufacture of screws patented since the date you name. If you have a new plan it would be well to send us a sketch. We can then tell you whether it is probably patentable.

J. H. C., of Pa.—We are sorry to inform you that your article was not preserved. Communications not inserted are necessarily destroyed, unless the owners express a wish to have them returned. We cannot inform you how high the goods were raised by hydraulic lift; probably the hight of common warehouses.

H. L. A., of Ill.—We have had the subject of hot-air engines pretty well discussed of late. Roper's engine or furnace is fired as any ordinary one is, but the door is air-tight, and the charge of fuel is put in as quickly as possible.

R. B. H., of Conn.—The best and least expensive method of finding the pressure in your small steam boiler, is to apply a thermometer—or, more properly, insert one. The temperature will thus be indicated, and from that the pressure. Thus, if the thermometer reads 228° of heat, there are five pounds per square inch in your boiler. Thermometers for this purpose can be had of S. C. White, Dental Repository, N. Y.

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our reception of their funds

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired

RATES OF ADVERTISING.

TWENTY-FIVE CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published we will explain that eight words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

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IMPORTANT TO ALL.—BUILDINGS AND SHIPS OF every description thoroughly ventilated, and smoky chimneys cured, by the application of Griffith's Patent Double Self-acting Archimedian Screw Ventilator and Smoke Conductor. We challenge the world to produce its equal. The least breath of air will cause the heat to rotate with great velocity, thereby working a screw fan in the cylinder, creating a powerful current, and establishing at once a circulation of pure air through any building, ship or chimney. They have been applied within the last four years to thousands of buildings of every description, including hospitals, factories, churches, halls, schools, dwellings, etc., with unparalleled success. Send for book of reference.
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TO MATCH MANUFACTURERS.—Professor H. DUSSAUCE, Chemist, is ready to furnish drawings of apparatus to manufacture matches; also the processes for making common matches, candle matches, matches without sulphur, matches with amorphous phosphorus, fancy matches, matches without phosphorus. He indicates also the preparation of white and amorphous phosphorus, bi-oxide of lead, and other chemicals used in that fabrication. Address New Lebanon, N. Y. 1*

THE WINANS' ANTI-INCRUSTATION POWDER AT last Pirated. Beware of imitations. Cheap as anything offered, and better. H. N. WINANS, N. Y. 1*

CALIFORNIA INVENTION.—ORLANDO FULLER'S Improvement in Bracing and Fastening Spiral Springs for Mattresses and other work where spiral springs are used. This invention was patented the 25th day of October, 1865.
The following statement, which I copy from the *Mining and Scientific Press* of San Francisco, will explain the invention:—
No. 483.—I. & C. SCRIBER, San Francisco, Cal.—Spring Mattress four feather pillows, two pulu pillows, one bale of pulu, one bedstead.—These gentlemen have on exhibition a spiral spring bed, for which a patent was issued on the 25th of October, 1865. The peculiarity of the patent consists in the mode of tying the springs, being tied near the center downward, making the bed firm and substantial, as well as elastic. From the center up to the top of the spring, separately, runs a cord, which forms a brace to each spring, giving a double action to each spring, and making a softness which no other mode of adjusting can give. It is admitted by manufacturers and dealers and others who have this new patent in use to be superior to any spring bed heretofore offered to the public. This exhibition is well worthy of examination by all those in want of a comfortable bed, or other similar articles of furniture. The spring mattress mentioned above is a California invention known as Orlando Fuller's improved method of bracing spiral springs. The exhibitor holds the right for this State.
Any person wishing to purchase the right for the United States, except California, will call at
DR. W. H. FULLER'S DRUG STORE,
No. 45 Sullivan street, between Grand and Broome streets, where a sample mattress can be seen, or to
M. GROSSMAN, Upholsterer,
No. 198 Sixth avenue,
or at the AMERICAN INSTITUTE FAIR,
On Fourteenth street.
1*

I WISH TO COMMUNICATE WITH MANUFACTURERS of machinery for making Drain Tiles, also with manufacturers of Drain and Ditching Plows, with a view to purchase the best. Address S. B. COE, Norwalk, Huron Co., Ohio. 1*

THE SUBSCRIBER IS PREPARED TO FURNISH at short notice, of all sizes, the Andrews & Ralbach water-wheels, which gave 84·97 per cent effective force at Farmount test, Philadelphia, March, 1860; the Risdon Self-acting Circular Sawing Machines, of all sizes, the best in use for cutting logs into all sizes of lumber. Also, all kinds of mill work.
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WILLIAM Y. MCALLISTER,
14 3 No. 728 Chestnut street, Philadelphia, Pa.

WANTED—A SITUATION BY A MECHANICAL Engineer, who was engaged before the war in the sale of steam engines and machinery. Is competent to make the necessary plans and estimates for locating new machinery and superintending the erection. Address A. B., P. O. Box 2,178. 14 3*

CHARLES A. SEELY (LATE PROFESSOR OF Chemistry and Toxicology in the N. Y. Medical College), Consulting and Analytical Chemist. Analyses of Articles of Commerce, Medicines, Ores, Minerals, Etc. Advice and Reports on New Inventions, Instruction in Chemical Processes, Etc. 14 3*

H. C. FREEMAN, CIVIL AND MINING ENGINEER and Geologist.—Has 15 years professional experience. Is acquainted with most of the Western States, West Virginia, and several Southern States. Best of references East and West. Address, until Oct. 10th, Pomeroy, Ohio. Home address, South Pass, Union Co., Ill. 14 4*

PRESSURE BLOWERS.—B. F. STURTEVANT, MANUFACTURER, No. 72 Sudbury street, Boston. Blowers for all purposes where pressure of air is required, such as Cupola Furnaces, Forges, Brazing, Etc. Pressure of 1 to 1½ pounds to square inch easily obtained; runs easily, and warranted to need no repairs for five years; makes no noise. This Blower will take the place of ordinary Fan Blowers, which make pressure of about ½ pound, and run with one-half the power; will take the place of the largest and most expensive Blowers now used in Iron Founderies, which make pressure of ½ to ⅞ lb. Price from $45 to $175.
Also, Manufacture Fan Blowers of all sizes, up to No. 45, for Steamships, Iron Mills, Mines, Dry Houses, Etc. 8 11*

THE EIGHTEENTH ANNUAL EXHIBITION OF THE Maryland Institute of Baltimore, for the Mechanic Arts, will commence on Monday Evening, the 2d of October, and continue to Monday Evening, the 30th of October, 1865.
The hall will be open for the reception of goods on Monday, the 25th of September.
Goods for Competition and Premium must be deposited before Thursday Night, the 28th of September.
Circulars, embracing details, may be had of the Actuary at the Institute.
Communications addressed to the undersigned, or Joseph Gibson, Actuary, will be promptly attended to. W. W. MAUGHLIN,
3 3m Chairman Committee on Exhibition.

SIX THOUSAND AGENTS WANTED, TO SELL SIX New Inventions, of great value to families; all pay great profits. Send 15 cents and get 80 pages, or 25 cents and get 80 pages and a sample gratis. [9 12*] EPHRAIM BROWN, Lowell, Mass.

FOR DANIELLS'S PLANING MACHINES, CAR MORTISING, Boring Machines, Car-Tenoning Machines, Car Planing and Beading Machines, Etc., address J. A. FAY & CO., Cincinnati, Ohio 3 1y

MACHINERY.—S. C. HILLS, No. 12 PLATT STREET New York, dealer in Steam Engines, Boilers, Planers, Lathes Chucks, Drills, Pumps; Mortising, Tenoning and Sash Machines; Woodworth's and Daniels's Planers, Dick's Punches, Presses and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting Oil, &c. c

SAFETY MATCHES, WITHOUT PHOSPHORUS OR Sulphur. Recipe, $75. A. W. SPRAGUE,
13 3* No. 89 Washington street, Boston.

OFFICE DEPOT COMMISSARY,
FORT MONROE, Va., September 21, 1865.
GOVERNMENT SALE OF WHISKY.—SEALED PROPOSALS (in duplicate) are invited and will be received by the undersigned at this depot until 12 o'clock M on the 13th day of October, 1865, for the sale of one thousand seven hundred and fifteen (1,715) barrels of whisky, more or less, as follows, viz.:—
LOT No. 1.—Consisting of ten hundred and sixty-seven (1,067) barrels of Rectified Whisky, originally inspected in April, May and June, 1864, and January, 1865, containing about forty two thousand three hundred and forty-five (42,345) gallons. Proposals for ten (10) barrels and upward of this lot will be received.
LOT No. 2.—Consisting of four hundred and sixty (460) barrels of Pure Copper-distilled and Superior Bourbon Whisky, originally inspected in February, 1865, containing about eighteen thousand four hundred and ninety-eight (18,498) gallons. Proposals for five (5) barrels and upward of this lot will be received.
LOT No. 3.—Consisting of one hundred and twenty (120) barrels of Pure Rye Whisky, originally inspected in February, 1865, containing about four thousand eight hundred (4,800) gallons. Proposals for three (3) barrels and upward of this lot will be received.
LOT No. 4.—Consisting of sixty-three (63) barrels Pure Old Rye Whisky, originally inspected in February, 1865, containing about two thousand five hundred and twenty (2,520) gallons. Proposals for two (2) barrels and upward of this lot will be received
LOT No. 5.—Consisting of five (5) barrels Pure Old Bourbon Whisky, originally inspected June, 1864, containing about one hundred and sixty-three (163) gallons. Proposals for one (1) barrel and upward of this lot will be received.
The whisky was originally selected with great care, and is all pure and of prime quality. The Rectified was designed for issue to the troops in the field, and the Bourbon and Rye for sales to officers, and are equal if not superior to any whiskies now in the market; has all been regaged within the present month, and is in excellent order, packages being of the best quality.
Samples of the whisky can be seen and blank proposals can be obtained at the offices of the following-named officers of the Subsistence Department, viz.:—
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Brevet Brigadier-General THOS. WILSON, C. S., Baltimore, Md.
Major GEORGE BELL, C. S., Washington, D. C.
Captain THOMAS C. SULLIVAN, C. S., Richmond, Va.
Captain E. D. BRIGHAM, C. S., Boston, Mass.
Captain J. B. WIGGINS, C. S., Philadelphia, Pa.
The Government reserves the right to withdraw any or all of the above lots, and to reject any proposals deemed too low.
Payment to be made in United States currency within ten (10) days after notification of acceptance of bid and prior to delivery of the property.
A guaranty equal to one-half the amount proposed for must accompany the bid, signed by two (2) responsible parties.
When removing the whisky, purchasers will provide their own transportation, and the Government will load the vessels free of wharfage, dockage, or labor.
Bidders are invited to be present at the opening of their proposals. Brevet Brigadier-General Joseph Roberts, U. S. A., commanding at Fort Monroe, Va., or some other officer of rank, will be present at the opening of bids to represent absentees.
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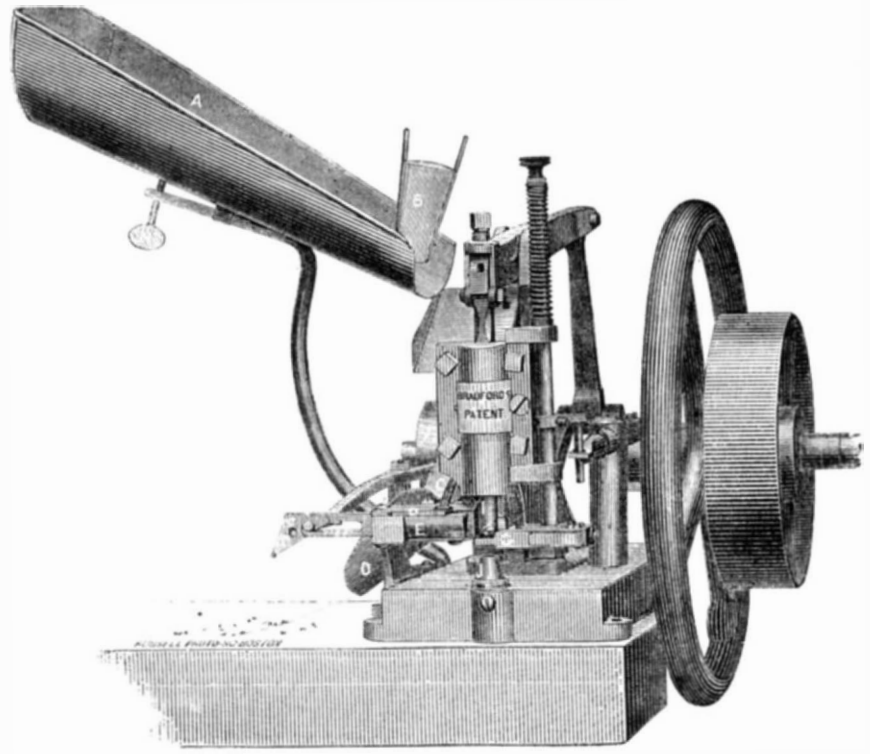


BRADFORD'S TACK-LEATHERING MACHINE

Any person of ordinary intelligence, who can run a sewing machine, can operate the machine readily and profitably; its size and general character being similar to that of the common sewing machine. An ordinary operator is able to leather from 150 to 170 tacks per minute, or 90 to 100,000 tacks in a day, with each machine; and what is of most importance to tack manufacturers, it will successfully leather tacks any quality of finish, while other machines require the best finished tacks for leathering. The action of the machine is such that only one tack can be taken up at a time, and no jammed or imperfect tack can pass it at all; while the motion of the grip and punch is so adjusted that every tack is leathered uniformly through the center; thus avoiding all crooked or broken tacks, as well as the forcing of two or three tacks through one piece of leather; and furnishing in bulk only perfect work. The simplicity in the construction of this machine is such as to render it rarely liable to get out of order; which fact is claimed to be greatly in its favor. This machine is on exhibition at the Fairs in this city and Boston.

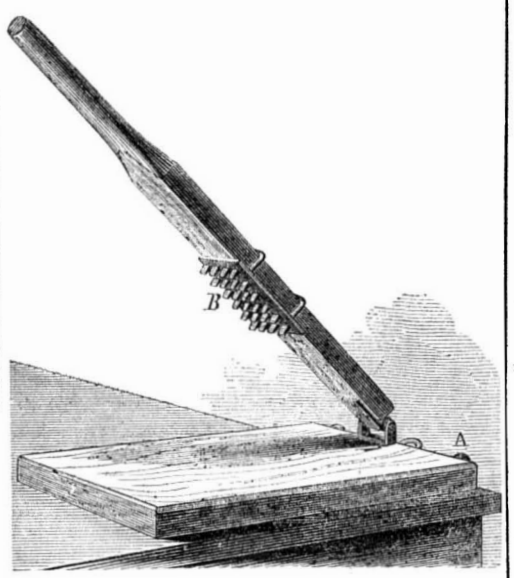
Further information will be furnished, on application to the sole proprieters, Barry, Bradford & Co., No. 4 Brattle Square, Boston, Mass.

PUTNAM'S BEEFSTEAK BREAKER.

This is a machine designed to make porter-house steaks out of rump steak; or, in other words, to convert bullock beef into delicious tenderloins—to make the skinny, sinewy slice, sold by butchers not envious of fame, equal to that richly-mottled cut which graces the table of Dives.

This is no mean achievement. Language is too poor to convey an idea of the anguish which fills the soul of him who would dine when he sees a slab cut from one of Pharaoh's lean kine stretched before him. But once place any apology for a beefsteak in this apparatus, bear down on it, put the iron teeth well into its sinews, and lo! its spirit is subdued, its resistance is overcome, and the hungry man can fall-to with what zest he possesses. Ordinary beefsteak pounders mash the meat into a viscous pomace. They make disgusting shreds of it; they tear it to tatters, and the juice flies to all corners of the room. None of it remains in the beef, which is, there-fore, a dry and bitter morsel in the mouth—bitter as the apples of the Dead Sea, which turn to ashes (we are credibly informed) in the mouth of the eater.

This is a most convenient and useful thing to have in the house, for it can be applied not only to crush beefsteaks, but to break ice, to press fruit for jelly, or to crack loaf sugar. By suspending sad irons from the end of the lever, corned beef can be pressed in shape. To do this it would be necessary to make the fulcrum end of the lever adjustable. When steaks are to be crushed they are simply laid on the board and the lever brought down against them. There are two links on the back end which catch over the edge of the table and hold the board down so that it cannot tip. The crusher, B, slides on the lever so as to be used at any point. This machine is entirely noiseless in its action, which is quite a recommendation in its favor.



This invention was patented through the Scientific American Patent Agency on Dec. 27, 1864, by G. W. Putnam; for further information address him at Peterboro', N. Y. Windle & Co., No. 56 Maiden Lane, New York, sell the article.

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